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The psychosocial effects of compensated turnout on dancers: a critical look at the leading cause of non-traumatic dance injuries

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The Psychosocial Effects of Compensated Turnout on Dancers: A Critical Look at the Leading Cause of Non-Traumatic Dance Injuries

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Abstract

Dancers suffer from extremely high injury rates compared to the general population (Noh, Morris, & Anderson, 2003). Most of the injuries are overuse injuries (60-75%), as opposed to traumatic injuries (Thomas & Tarr, 2009). One of the most common overuse injuries is compensated, or forced, turnout (Negus, Hopper, & Briffa, 2005). Continual misplacement of turnout wears and tears on the body, leading to pain and injury. However, dancers feel the risk is worth it to stay relevant in a physically demanding career that has little-to-no off-season to heal (McEwen & Young, 2011). Dance companies typically have the mindset of pushing through the pain, because the show must go on, and there is always another dancer in the wing waiting to take someone's role (Krasnow, Kerr, & Mainwaring, 1994). The pressure to compensate their turnout, and to ignore any pain or injury often leads to a more serious injury. Dancers also feel that they are unable to take time off, therefore those who do often experience psychological distress. They feel like they are weak, they will lose their spot in the company, lose income, and ultimately lose their identity (McEwen & Young, 2011). Therefore, the psychosocial pressures lead to physical ailments, which in turn add to the psychological distress (Williams & Anderson, 1998). This study combines research on compensated turnout injuries and the psychology of the dancer to determine why dancers have these high injury rates. By understanding the reason behind the injuries, dancers and healthcare professionals can work together to lower the rates of injury and improve self-esteem.

Introduction

From my first dance class at age three my life revolved around dance. Growing up I was unable to picture a life that did not involve dance in some way. This passion—obsession even—so consumed me that when I was nine years old I refused to report an injury to my ballet instructor. I had just won two roles in my first ever professional company performance of The Nutcracker. It was the only performance students could dance with the professional ballet company at my studio. Shortly after auditions I sprained my ankle but with ice and ibuprofen I danced through the pain, only reporting it to my instructor and going to the doctor after I finished my final performance of the season. Even at age nine I was anxious to return to dance class, knowing I was falling behind with each passing class. Not soon enough for me, I was able to return to dance and continued dancing until I was fifteen years old. In the middle of a routine my knee dislocated and I suffered a complete rupture of the ACL in my right knee. Despite this numbing pain I felt in my knee I felt the surge of adrenaline that came from dancing and the pressure to finish my routine, I continued. After a few eight counts I realized the next trick would be impossible to land if my knee was unstable. I scooted out of the way of my team and waited for them to finish before I drew more attention to myself.

As I was being carried out of the room I promised I would make it to the competition only two days away. After two knee surgeries and thirteen months of physical therapy I forced myself to come to terms with the fact I would not be able to dance again. For twelve years my life had revolved around dance and I could not remember a time in which I did not identify as a dancer. I spent months in denial, believing that even on crutches I would be able to make it to a competition. After nine months of physical therapy and several cautious attempts at dance technique I finally realized I had to let go of my dream of being a dancer. Those nine months were filled with anxiety of watching my team practice and compete without me. I knew that I

was falling farther and farther behind from my peers in regards to my technique as a dancer. Once I knew I could not physically dance at the same level I used to, I no longer knew who I was. I spent several days over that next year crying and struggling with my identity. I could not watch The Nutcracker, a pep rally, or any dance routine for a few years without crying because of the pain I felt of being an audience member for the first time.

I was fortunate to have a supportive family and friend group who helped me discover who I was off the dance floor. My physical therapist and orthopedic surgeon did everything they could to make me feel understood in the mental struggle that followed my physical rehabilitation. Not all dancers get the support I received, but my story is one that most dancers have experienced to some degree. Dancers often begin their career around three years old and do not know of no other world. The physical strains of dancing so hard for so long often catch up to individuals, who like myself, would rather dance with pain that give up an opportunity like being in The Nutcracker. I felt very alone when I had to give up dance. My personal experience has led me to research dance injuries and responses and in doing so I have learned that my journey is similar to what most dancers go through. Injury rates in dance fields are as high as 97% and 60-75% of those injuries are attributed to overuse or technical faults and are thereby preventable (Rivera, Alexander, & Nehrenz, 2012). Of these overuse injuries, the majority stem from compensated turnout and will therefore be the lens through which I explore the physical and psychosocial elements of dance injuries.

Life of a Dancer

The life of a dancer requires immense dedication starting from as young as three years old and continuing into her thirties. Such dedication requires long hours and vast expenses as a student and even longer and greater as a professional. For those who are serious about dance the

art becomes a lifestyle, intertwining itself with one's identity. Dancers know that their stage career is a short one and that they will most likely retire before they are forty, therefore they put everything they have into this passion before their careers ends before the age of thirty-five. Dance culture is similar to sport culture in that both require participants starting at a young age, living a life that revolves around the sport, pouring money into the sport, and knowing that their professional career will be short-lived and will require them reinventing themselves after dedicating their whole life to the sport.

"We dance, we don't live"

The life of a professional dancer is often compared to that of a nun. Some dancers confirm this in their belief that getting married or pregnant could end her dance career and that "a true dancer lives for her art and nothing else" (Aalten, 2005, p. 5). It is here that there becomes a distinct difference between dancing and "living." Toni Bentley, a New York City Ballet dancer writes, "We call "living" what we don't do—we dance, we don't live…[we] periodically lapse into "living" habits, but the inevitable repercussions always let us know when living is interfering with dancing!" (Aalten, 2005, p. 5). Anthropologist Anna Aalten conducted biographical interviews to determine how dancers balance dancing with living. This anthropological study is extremely valuable because ballet is its own subculture and therefore can be difficult for outsiders to fully understand (Aalten, 2005).

As young dancers begin ballet school, there is an expectation that a dancer lives to dance and will want to spend all their time focused on their craft. Aalten (2005) calls to mind the concept of the "greedy institution" by Lewis Coser in which institutions "demand an exclusive and total loyalty from their members and absorb them completely. In exchange they offer a specific identity and a notion of belonging to a privileged group" (Aalten, 2005, p. 8). Again, this is similar to the comparison of the ballet company to the convent. Joseph Mazo's article of the

New York City Ballet describes the "chosen people mystique" because there is a belief that "one has been called to serve an ideal beyond the power of those who remain outside the walls" (Aalten, 2005, p. 9). This however creates a dependency of the dancers on their instructors and directors because they are the "gatekeepers" of this world (Aalten, 2005, p. 9). This dependency lends itself to the authoritarian atmosphere of ballet (Aalten, 2005).

The dancers Aalten (2005) interviewed did not struggle with dancing and living as much as expected. Each creates their own balance between the two or decides to find their life within ballet. The young retirement age also allows them "the time and energy to do other things besides dancing" (Aalten, 2005, p. 11). Dancers are able to start their career early enough that they have time to reinvent themselves while still young. Most of the dancers interviewed did not plan on giving up starting a family for their dance career. One dancer described the predicament a dancer is in by stating,

> I think it is much healthier when you do other things besides ballet. Outside the company and the dance world. It helps you to stay sober. But it is possible that it's precisely because I did these other things that I never made it any higher than the corps. (Aalten, 2005, p. 13)

So while dancers struggle with finding and maintaining a life outside of dance, they are better at maintaining that balance than is perceived. However, this discrepancy could be attributed to the well-known passion of dancers as well as the young age their careers begin and end (Aalten, 2005). This assumption also takes away the multidimensional personalities of dancers and limits them to a dancing machine with no autonomy over their lives.

From Preschool to Pointe

Three years old is the best age to start dance classes because they are likely to be accustomed to a class-like environment, either from preschool or daycare (Dance Academy

USA, 2018). At this age they are toilet-trained and are able to be away from their parents for a short amount of time (Dance Academy USA, 2018). Three-year old children will likely take a forty-five minute class about once a week (BalletHub, n.d.; Gobeille, n.d.). Once they are four or five years old they might start dancing twice a week (Gobeille, n.d.). At six years old they should be taking at least two classes a week and the length of the classes usually increases to an hour long (Gobeille, n.d.). By the time a student is eight years old, if she/he is serious about dance, she/he should be taking three classes a week (Gobeille, n.d.; The Ballet Blog, n.d.). From ages nine to twelve students should be taking four classes a week with the time extended to an hour-and-a-half (Gobeille, n.d.; The Ballet Blog, n.d.; BalletHub, n.d.). If a dancer is still serious about pursing a dance career by the time she/he is fourteen years old she/he can become a full-time ballet student (The Ballet Blog, n.d.). At this point they should be dancing five-to-six days a week (BalletHub, n.d.) taking ten-to-fifteen classes a week. This training can take up to six or seven hours a day (Rigby, 2012). When most students graduate high school, dancers begin their professional dance career (Bedinghaus, 2017).

Dance students who begin lessons at three years old and continue until eighteen before either quitting or moving into the professional sector will spend fifteen years in classes, adding up to high costs. Due to the specific training and shoes required of ballet, it is the most expensive style of dance. Abby Abrams (2015) calculated the estimated cost of fifteen years of student ballet classes. She researched the costs of tuition fees, summer camps, and attire. Median dance school prices for fifteen years can cost between $30,000-$53,000 depending on the prestige and seriousness of the studio. Those studios can also charge around $2,000 dollars for other fees over the years. Dancers who are intent on a professional career must take summer classes, and for six summers at the top-tier camps, families can spend over $32,000. Ballet attire includes tights and

leotards which will cost more than $2000 over those fifteen years. Ballet students typically start dancing en pointe around eleven, and for those seven years pointe shoes will cost around $29,000 (Abrams, 2015). The grand total for fifteen years is estimated to be $120,000. However, that cost does not account for cost of transportation, extra dance classes, or private sessions, which are necessary to perfect skills (Abrams, 2015). Costs for other attire including tutus and sweats will also build up over the years. If the company holds recitals, families will also have to buy extra costumes and accessories, averaging $75 per costume, but most dancers, especially advanced ones, will be in multiple performances in the recital requiring multiple costumes (Bedinghaus, 2017). Dance competitions require an entry fee and more costumes on top of transportation (Bedinghaus, 2017). Other breakdowns of tuition show classes can cost between $60-$150 per month (Bedinghaus, 2017). Leotards can cost between $10-$30 and tights $5-$25. Ballet shoes can be $15-$70 but the most expensive ballet attire are the pointe shoes which can cost around $80 (Everyday Health, 2017). Dancers may be required to buy specific shoes and leotards for a uniform look in the classes (Everyday Health, 2017). None of these costs cover medical costs in the event of an injury. A young dancer who is taking more than ten hours a week is more likely to injure her/his foot or ankle (The Ballet Blog, n.d.) and over fifteen years of serious dance training, most will suffer some sort of injury. An injury can require doctors' appointments, physical therapy appointments, and possibly even surgery. This much money necessitates a commitment from the entire family and knowing the costs can help a young dancer determine if this is a career she/he wants to pursue.

The high cost of being a student translates into low paid professional salaries. There is a wide range of salaries due to the different avenues professional dancers can pursue. According to the Bureau of Labor Statistics, there were more than 11,000 professional dancers working in

theaters or companies in 2009. These dancers averaged $34,424 for that year (Suttle, 2017). The jobsite *Indeed* reported that in 2013 professional dancers made $24,000 (Suttle, n.d.). An hourly breakdown shows a median wage of $14.44/hours, but the range is from less than $8.56 per hour to more than $33.03 per hour (College Grad, n.d.). These numbers mean that most dancers take a side job to help support themselves (Career Igniter, n.d.).

Professional dancers train for six hours a day for (Dance National Arts Centre, n.d.) five-to-six days a week (Nedvigin, n.d.). The training usually starts with an approximate hour of warm up class before starting rehearsals (BalletHub, 2016). Unlike professional athletes, professional dancers do not have an offseason and therefore follow this physically demanding schedule for the entire duration of their career (Rigby, 2012). Dancers also take cardio, yoga, and Pilates classes and typically weight train on their own time (Dance National Arts Centre, n.d.). This grueling schedule contributes to the high injury rates of dancers. It is estimated that 80% of professional dancers sustain one serious injury (Dance Facts, n.d.), but other researchers state that 97% of dancers suffer injuries over their entire dance period, not just during their professional career (Air, 2013). The schedule does not allow for the dancer to rest or take time to heal potential injuries. This can decrease the dancer's "strength, coordination, cognitive and immune functions" making them susceptible to injury (Dance Facts, n.d.). The minds and bodies of ballerinas can only take so much of the pressure and demands therefore most dancers retire at age thirty-five (Claytor, 2013). Some can go into their late thirties and a little beyond depending on their injuries (Nedvigin, n.d.). Ninety-three percent of dancers started teaching because they suffered an injury that ended their professional career (Dance Facts, n.d.). Ballet is an art form that requires focus and discipline. Dancers must overcome competition, high pressure, and the physical toll it takes on their body, all to end up battered and bruised and retired young. Despite

this, ballerinas have a true passion for it and struggle with their identity once they have retired, whether by choice or by injury.

Angela Pickard (2012) studied twelve ballet dancers between the ages of ten and fifteen to discover how dance becomes intertwined with one's identity. Ballet students must "accept emotional and physical suffering for the sake of ballet as a performance" because ballet insists on perfection (Pickard, 2012, p. 25). An eleven-year-old stated that "you have to look perfect and be perfect" while a fifteen year old said that "good enough won't get people to pay to see you. It's got to be perfect" (Pickard, 2012, p. 35). This emphasis comes from the "high culture" connection to royal performances in Europe when ballet first began (Pickard, 2012, p. 26). Dancers not only train to please themselves but also their instructors because of the hierarchical traditions of ballet. This is furthered with the body being viewed as an object in the sense that it can be touched and molded to perfection by the instructors. Status and positions in dance require devotion and focus until "ballet literally becomes ingrained in their body" (Pickard, 2012, p. 40). This intertwining of body and identity at such a young age sets dancers up for an identity crisis if their body can no longer dance due to fatigue or pain (Pickard, 2012).

Starting over at Thirty-five

A dancer who begins at age three and retires at thirty-five has spent thirty-two years identifying as a dancer. Subsequently, professional dancers do not see it simply as a job, which can make it much harder to leave (Career Igniter, n.d.). Performing releases endorphins making it more difficult to leave because dancers can struggle to find another job that can "make them feel so connected and alive" (Dance National Arts Centre, n.d.). One dancer, Karen Portner-LaPointe, could not go to a ballet performance after she quit without "sobbing uncontrollably" (Claytor, 2013). She was unsure who she was anymore. Part of what made quitting so painful for her was

that she had spent so long with people so similar to her and then she was “out in the world and no one really gets you” (Claytor, 2013).

Another dancer, Martha Graham, said, “a dancer dies twice—Once when they stop dancing, and this first death is the more painful.” (Muzaffar, 2014) Not only do dancers have to let go of their passion, but they are often left with an unstable future. Retiring dancers usually do not have financial security and leave with a severance pay of a few weeks at most. One dancer describes this venture into the unknown by saying, “When you are a kid, you find so much comfort in dancing. I was comforted. [I thought,] I am safe. But then in the end, you are not really safe.” (Muzaffar, 2014). The Career Transition for Dancers is a program that was developed in 1985 to help retired dancers find new careers and utilize the skills they developed while dancing (Career Transition for Dancers, n.d.). This assistance is valuable because the dance world is a subculture of its own, and needs people who understand the life of a dancer to help them transition out of being a professional dancer.

Introduction to Turnout

The term “turn out” in sports refers to the influx of fans that come out to cheer for their team during a game. The position “turnout,” and its descriptive properties are unique to dance, especially ballet. The denotation of the word is simple enough: turn an extremity out. All movements in ballet require limbs to be turned out as part of the dancing style. Throughout ballet turnout has become one of the most important and most common stylistic instructions. However, with its ever-expanding list of connotations, it lacks an exact definition in the dance world.

In general, turnout can be the descriptive instruction of turning limbs out or it can be first position (See Appendix A for visual examples of turnout). First position is the placement of the heels together and toes from each foot pointing away in opposite directions from the heels. Each

study provides its own definition of "turnout" which varies slightly. It can broadly be defined as "the sum of hip rotation, tibial torsion, and contributions from the foot," but this does not describe the physical position (Grossman, Waninger, Voloshin, Reinus, Ross, Stoltzfus, & Bibalo, 2008, pg. 142). Others have gone further to say it involves "externally rotating the hips and aligning the knee with the second metatarsal of the foot" or "standing with the hips and knees extended occurs when the heels are together and a straight line is formed through the axis of the foot" (Khoo-Summers, Prather, Hunt, & Van Dillen, 2013, pg. 137). The longitudinal axes should "establish a 180^{o} angle" (Champion & Chatfield, 2008, pg 121) from the "rotation of the lower limb in relationship to the trunk" (Khoo-Summers, Prather, Hunt, & Van Dillen, 2013, pg. 137) in which "each leg is rotated in the opposite direction from the other and facing away from the midline of the body as observed from the front" (Wilmerding & Krasnow, 2011, pg. 1). Within these definitions is further categorization of turnout. Technically correct turnout involves maximum hip external rotation with the weight centered down the knee and ankle. Functional turnout is the position the dancer chooses to stand. Compensated turnout is determined by the difference of technically correct and function turnout (Champion & Chatfield, 2008). While each of these definitions attempt to define turnout, without a standardized definition, it is difficult to study the position because individual studies cannot be identically replicated. Incorrect turnout is one of the leading causes of dance injuries, and therefore research on the position is pertinent for dancers and healthcare professionals to lower risk of potential injury (Negus, Hopper, & Briffa, 2005).

One of the hindrances to defining turnout is the struggle to measure turnout. Studies explain their measurement process, however there is not a universal agreed upon method among the dance world (Champion & Chatfield, 2008). This is due in part to the different uses of

turnout in different genres. Turnout is most commonly thought of as being ballet-specific, however, it is used in other genres such as modern and contemporary, just to a lesser extent (van Merkensteijn & Quin, 2015). Therefore, how a study measures turnout depends on what genre they are focusing on.

Even after researchers explain what style of dance they are studying and provide their definition of turnout, there are even more obstacles to measure turnout. As previously stated, turnout involves the entire lower body which requires multiple body parts to be measured and calculated (Grossman, Waninger, Voloshin, Reinus, Ross, Stoltzfus, & Bibalo 2008). Studies sometimes just measure the hip, the knee, and ankle, but these are unable to create a detailed picture of the turnout. Other factors such the flexibility of the dancer and their individual body and joint geometry must also be accounted for. Furthermore, each dancer has her/his own variation of turnout, which makes it difficult to estimate how much a dancer should have (Grossman, Krasnow, & Welsh, 2005). Depending on the way a dancer is built or what areas of her/his body are more flexible can affect how she/he stands. A comprehensive guide to turnout needs to specify all the parts of the body involved in turnout and account for individual differences.

History of Turnout

Turnout is most often used in ballet, which has evolved since its emergence in the 1500s. Beginning in Italy, ballet's introduction to the French court of King Henry II led to its current terminology (Nedvigin, n.d.). Around the 1600s the ideal turnout was a more realistic goal of 90^{o}. Throughout the next century turnout continued to grow in degree until 180^{o} was the aim of dancers. This gradual development occurred because turnout of extremities provides greater range of motion. True to ballet form, this change also occurred due to the aesthetic appeal, which has not changed since the 18th century (Coplan, 2002).

While turnout is used in most forms of dance, it is most used and most important in ballet. Other styles alternate between parallel and turned out positions but ballet always stresses turned out extremities. Turnout is a fundamental step in ballet because all movements either originate or pass through one of the five ballet positions (Coplan, 2002). Its prevalence has turned the position into a visual aid when examining dancers. It is assumed that a dancer with a greater turnout is naturally more flexible, or even a better dancer (Reid, 1988). This is incorrect, however, the idea still exists in the ballet world. Therefore, turnout has become of the upmost importance for dancers to achieve. It is believed that the closer a dancer's turnout is to 180^{o}, the better dancer she/he is perceived to be.

When dancers are unable to naturally stand in a 180^{o} turnout, they sometimes make compensations to appear that they have a perfect turnout. This involves forcing the turnout farther than a dancer's hips allows. Most dancers do not have the natural hip flexibility necessary and therefore compensations are incredibly common (Wilmerding & Krasnow, 2011). The pressure to have a perfect turnout pushes dancers to put the position over the well-being of their body. Since turnout is a visual aid to a dancer's ability and flexibility, there is a mindset that permeates the dance world that those with better turnout will get better roles or more time on stage. Those with a naturally smaller turnout fear they will lose out and fall behind in their career (Grossman, Waninger, Voloshin, Reinus, Ross, Stoltzfus, & Bibalo, 2008). Therefore, they start to use other parts of their body to appear to have a greater turnout. However, these compensations make up the majority of overuse injuries in dancers (Khan, Brown, Way, Vass, Crichton, Alexander, Baxter, Butler, & Wark, 1995). The foot, ankle, hip, knee, and back are most commonly affected body parts. The wear-and-tear injuries include sesamoid problems, plantar fasciitis, cuboid syndrome, medial tibial stress syndrome, Achilles tendon injury,

patellofemoral joint problems, stretching of the medial ligament and medial joint capsule, patellofemoral joint syndrome, iliotibial band friction syndrome, hip flexor problems, and more (Khan, Brown, Way, Vass, Crichton, Alexander, Baxter, Butler, Wark, 1995). Despite how compensated turnout affects the body, dancers continue to make this purposeful mistake to further their career (See Appendix B for visual examples of compensated turnout).

Turnout

The anatomy of turnout involves the lower half of the dancer's bodies. At first glance, it is easy for the untrained eye to only notice the outward rotation of the feet without realizing it takes a group effort of bones pulled into specific positions by the lower muscles. The spine, hip, knee, femur, tibia, ankle, and foot all contribute (Champion & Chatfield, 2008; Grossman, Krasnow, & Welsh, 2005; Khoo-Summers, Prather, Hunt, & Van Dillen, 2013). The six deep lateral rotators and the gluteus maximus are the most important muscles in turnout. The rotator muscles pull the greater trochanter of the femur back towards the pelvis to achieve turnout (Wilmerding & Krasnow, 2011.)

Variations in anatomy contribute to individual's ability to achieve a high level of turnout. Retroversion, as opposed to anteversion, predisposes a dancer to have a more natural and wider turnout. This physical attribute cannot be altered with training. If a dancer is born with a hip socket that faces more to the side than forward, she/he will be able to begin their turnout with a greater amount of rotation. A femur with a longer and more concave neck is better able to allow the maximum range of motion because it will not get in the way of the acetabulum. The iliofemoral ligament and the pubofemoral ligament surround the hip and work counter to external rotation. The more lax the ligaments are, the greater the turnout will be, but this can destabilize the hip and therefore no attempts to increase flexibility here should be made. The

only factor than can potentially be improved upon is the strength and flexibility of the muscles surrounding the hip (Wilmerding & Krasnow, 2011).

There is a discrepancy between researchers about how much each joint should contribute, but the hip is universally agreed to be the greatest contributor. The hip is a ball-and-socket joint and thus has the greatest range of motion (Khoo-Summers, Prather, Hunt, & Van Dillen, 2013). The lower leg should only turnout as much as the hip, never more. The hip should make up between 54-78% of the turnout, or about 70^{o} (Jenkins, Wyon, & Nevill, 2013; Gilbert, Gross, & Klug, 1998). The tibia and foot should each contribute 5^{o} and 15^{o}, respectively (Gilbert, Gross, & Klug, 1998). Despite researchers saying that 58% of the external rotation should come from above the knee, the lower leg, particularly knees and feet, are more noticeable when standing in turnout (Khoo-Summers, Prather, Hunt, & Van Dillen, 2013). The hips typically do not get as much attention on first glance, but it is easier to see how far out the feet are from one another.

It is crucial that the lower limbs do not try to turn out farther than the hip in an effort to gain degrees. When a dancer does this, they are disrupting the biomechanical chain of their lower body. This creates an imbalance of the loading, putting more strain than structures are meant to handle. This in turn causes injury (Jenkins, Wyon, & Nevill, 2013). Similarly, the kinematic chain theory posits that each joint movement in the lower extremities leads to a chain reaction. If a joint is used in compensation, it will not only hurt that joint, but potentially all other that follow. This idea follows the 3-joint model, in which the range of motion of the distal and proximal joints affects the likelihood of an injury of the original joint (Steinburg, Siev-Ner, Peleg, Dar, Masharawi, Zeev, & Hershkovitz, 2012).

Turnout Measurements

The lack of a standardized measurement protocol has lead researchers to defining their own methods, tailored to their individual studies. In order to measure turnout, researchers must

define the types of turnout. One study categorized turnout as technical, functional, and compensated. The technical turnout consists of the maximum rotation a dancer can make while keeping their weight centered through their knees and ankles. The functional turnout is the one the dancer assumes when typically dancing. The amount of compensation was determined by how much greater the functional turnout was compared to the technical turnout. (Coplan, 2002). Similarly, a comparison between the range of motion of the hip and the dancer's assumed turnout can uncover compensations (van Merkensteijn & Quin, 2015).

The above studies measured turnout in first position. While first position is the most common visual in a discussion of turnout, it is also utilized in all five positions, as well as landing positions. The Negus et al study (2005) described a more involved method of finding compensated turnout. They measured first position, fifth position with both feet forward, and landing position. The landing position was specifically used because it is less possible to be able to compensate and therefore would more accurately reflect a dancer's turnout. Using a goniometer, they measured passive and active range of motion in supine and standing positions. The supine position provided more stability when measuring external rotation. The standing turnout positions as well as the landing positions were traced on paper. They determined compensated by subtracting the active external range of motion in the hip from the standing turnout positions. Researchers found that compensations were greater in fifth position than in first (Negus, Hopper, & Briffa, 2005).

Goniometers are the tool of choice for researchers measuring turnout, but Grossman et al tested its reliability by comparing its results with other methods. They used the goniometer to measure total passive turnout, total active turnout, and hip external rotation. Hip external rotation was measured with the dancer prone and knee flexed and again seated with the hip and knee

flexed. Passive turnout was measured in the supine position and active turnout was measured standing. They also used rotational disks to measure turnout. Using Magnetic Resonance Imagining researchers measured tibial torsion. Retro-reflective markers were used to measure total passive turnout. The markers were placed on the adductor tubercle of the femur, the greater trochanter of the femur, the medial malleolus of the tibia, the tibial tuberosity, and the second toe. The combined measurements of tibial torsion and hip rotation were comparable with the total passive turnout measurements. This study has opened the door for more research on different methods to measure turnout besides the standard goniometer (Grossman, Waninger, Voloshin, Reinus, Ross, Stoltzfus, & Bibalo, 2008).

Compensated Turnout

Turnout is the basis for all movements in ballet because all movements either originate or pass through one of the five positions, which all require turnout (Coplan, 2002; Gilbert, Gross, & Klug, 1998). The prevalence of the turnout creates an emphasis on having a perfect, or ideal 180^{o} turnout (Champion & Chatfield, 2008). Dancers therefore believe that a smaller turnout will hurt their career (Grossman, Waninger, Voloshin, Reinus, Ross, Stoltzfus, & Bibalo, 2008). Furthermore, because it is easier to see the external rotation of the feet rather than the hips, it is tempting to force their feet out farther than natural to create the allusion of a greater turnout (Khoo-Summers, Prather, Hunt, & Van Dillen, 2013).

Dancers compensate their turnout because they are unable to reach the 180^{o} turnout naturally (Steinburg, Siev-Ner, Peleg, Dar, Masharawi, Zeek, & Hershkovitz, 2012). The segments that make up turnout can be broken down into ideal degrees and percentages, but those are only accurate if the dancer was born with the ideal anatomy (Wilmerding & Krasnow, 2011). Younger dancers whose soft tissue is still adaptable are able to perform more extreme external

rotation (Reid, 1988). However, at eleven a dancer's turnout is stabilized because of the fixation of the femoral neck angle (Gilbert, Gross, & Klug, 1998).

There are specific compensations that dancers use when forcing their turnout. One of the most common ways is the screw home mechanism, also referred as screwing the knee or the deep knee bend (See Appendix B.a. for screw home visual) (Coplan, 2002; Gilbert, Gross, & Klug, 1998; Winlsow & Yoder, 1995; Wilmerding & Krasnow, 2011; Reid, 1988; Negus, Hopper, & Briffa, 2005). Anatomically, it is the excessive rotation of the tibia. Dancers do this by standing in first position with their heels together and their toes as far apart as they can. The dancers then plié, or bend their knees. Then, using the floor as friction, they can forcefully slide their feet even farther apart (Coplan, 2002). Another typical compensation is excessive subtalar joint pronation, or simply rolling in of the feet (See Appendix B.b for rolling in of feet visual) (Gilbert, Gross, & Klug, 1998; van Merkensteijn & Quin, 2015; Wilmerding & Krasnow, 2011; Reid, 1988; Negus, Hopper, & Briffa, 2005). Once a dancer has pushed her feet as far out as she can, her feet can no longer support her body weight. By rolling in onto their feet, dancers are attempting to retain their balance. The pelvic tilt, or lumbar lordosis, is also utilized greatly when making compensations (Gilbert, Gross & Klug, 1998; van Merkensteijn & Quin, 2015). An anterior tilt is when the dancer tilts her hips and pelvis forward to increase her spinal curve that allows for a few more degrees of rotation from the hip (van Merkensteijn & Quin, 2015). However, ballerinas are supposed to have a straight back as part of their posture so there is a continual battle with anterior tilt and the posterior corrective tilt (Khan, Brown, Way, Vass, Crichton, Alexander, Baxter, Butler, & Wark, 1995).

Turnout incorporates almost all aspects of the lower body and thus there is a wide range of injuries dancers are vulnerable to when they make compensations. All bones, muscles,

ligaments, and joints involved in turnout are subject to pain or injury. The knee is continually cited as the most affected body part, including patellofemoral joint pain, medial collateral ligament irritation, stretching of the medial ligament and medial joint capsule, and medial menisci tears (Coplan, 2002; Gilbert, Gross, & Klug, 1998; van Merkensteijn & Quin, 2015; Khan, Brown, Way, Vass, Crichton, Alexander, Baxter, Butler, & Wark, 1995). Dancers can also suffer from pelvic and low back pain, hip flexor issues, and even snapping hip syndrome in younger dancers (Grossman, Krasnow, & Welsh, 2005; Khan, Brown, Way, Vass, Crichton, Alexander, Baxter, Butler, & Wark, 1995; Gilbert, Gross, & Klug, 1998). Compensations can lead to iliotibial band friction syndrome, medial tibial stress syndrome, and tibialis posterior tendinitis (Gilbert, Gross, & Klug, 1998; Khan, Brown, Way, Vass, Crichton, Alexander, Baxter, Butler, & Wark, 1995). Further down the leg, dancers can end up with flexor hallucis tendinitis or Achilles tendinitis (Gilbert, Gross, & Klug, 1998; Khan, Brown, Way, Vass, Crichton, Alexander, Baxter, Butler, & Wark, 1995). The feet can be affected in multiple ways, including plantar fasciitis, bunions, metatarsal stress fractures, seasmoid problems, and cuboid syndrome (Grossman, Krasnow, & Welsh, 2005; Gilbert, Gross, & Klug, 1998: Khan, Brown, Way, Vass, Crichton, Alexander, Baxter, Butler, & Wark, 1995)

The complexity of turnout requires multiple angles to be examined to provide a fuller understanding of this position and its importance. Compensated turnout, in particular, requires much attention since it is the leader in overuse—and hence preventable—injuries. Jenkins et al (2013) examined turnout measurements in dancers trained in contemporary and ballet to determine how strong of an indicator compensated turnout is to injury. Researchers measured passive hip external rotation, total passive turnout, and total active turnout and found compensated turnout and muscular turnout of the forty-seven dancers. The dancers then reported

injuries they had suffered during the ten months of the study to physiotherapists and to the researchers. From there, they were able to calculate that a 1% increase in compensation increased the odds of incurring two or more injuries by over 8%. This study was able to quantify exactly how much compensated turnout leads to injury, as opposed to just determining a correlation like previous studies (Jenkins, Wyon, & Nevill, 2013).

Negus et al (2005) examined the injury history and turnout measurements of twenty-nine pre-professional ballerinas. Each dancer reported at least one injury in the past two years, and all but two had suffered a nontraumatic injury at some point during their career. Injury was described as a physical problem that did not allow the dancer to dance as much as they do on a regular basis. When comparing measurements with injury history the researchers found that both the number and the severity of nontraumatic injuries are positively correlated with the variables measured, with the number of injuries correlating with 6/7 of the variables. The compensated turnouts were calculated from both first position and fifth, with the degree of compensation at 68.9 and 86.9 respectively. This study was therefore able to connect a low degree of functional turnout with a high amount of nontraumatic injuries because of the compensations of the dancers (Negus, Hopper, & Briffa, 2005).

One study focused on the relationship between range of motion and patellofemoral pain in dancers and how it is relevant to turnout. Over 23% of the participants suffered from patellofemoral pain. The dancers that had more restricted range of motion in their lower extremities were less likely to suffer from patellofemoral pain. This is because their turnout is more controlled and therefore there is no deviation from the kinematic chain. In this case, the patella is elevated vertically along the trochlear groove by the quadriceps femoris as the dancer stands in turnout. As dancers increase their range of motion over years of stretching, they move

into the hyper-external rotation realm. When they reach this increase of turnout and then plié, the kinematic chain is disrupted and sets them up for injury. The patella is instead moved laterally over the lateral condyle. The patella and the femur then come into forced contact, which can lead to the grinding of cartilage, and thus pain. Range of motion was explored in this paper; however, the researchers note that compensated turnout can also lead to patellofemoral pain. An interesting result researchers found was that patellofemoral pain was more affected by ankle, foot, and hip movement, as opposed to the knee. These findings support the kinematic chain theory that neighboring joints are involved in movements (Steinburg, Siev-Ner, Peleg, Dar, Masharawi, Zeek, & Hershkovitz, 2012).

The van Merkensteijn (2015) study researched the use of compensated turnout in modern dancers. Most studies focus on dancers who have ballet training because turnout is used more in ballet than genres that include more parallel positions. The researchers reiterate how common back injuries are in dancers, particularly in overuse injuries. Once again compensated turnout is cited as one of the main causes of the high injury rates in dance. They do note that as of yet there is no standard for measuring compensated turnout and therefore certain anatomical variations are not always taken into account. Using seventeen university dancers, van Merkensteijn et al (2015) measured active hip external rotation in the prone position using a goniometer and functional turnout in first position by tracing feet on paper. The difference between the two measurements was determined to be the compensated turnout. The dancers then reported injuries within the past two years. Seventy-seven percent had at least one injury during that timeframe, and 68% reported an overuse injury at some point in time. Unlike other studies, the foot-ankle was the most commonly injured site. There was a strong correlation between increased compensated turnout and lower back pain. The most surprising result of the study was that there was no

significant relationship between compensated turnout and overuse injuries, however, this could be attributed to the fact the participants were modern dancers and not ballerinas and therefore potentially use turnout and turnout muscles differently. Despite the difference in use of turnout and the smaller degree of compensations, all the modern dancers compensated at least a little (van Merkensteijn & Quin, 2015).

ITB tightness was examined in relation to patellofemoral pain and compensated turnout by Winslow and Yoder. Dancers often force their turnout by pushing their knees outward while bending, such as in a plié. This "deep knee bend" allows the tibia to rotate externally, while damaging tissues. Each dancer was tested for ITB tightness in both legs. They also recorded degree of foot turnout and the degree of external rotation in first position, and the degree of knee flexion in demi-plié in first position. Winslow and Yoder (1995) found a correlation between ITB tightness and patellofemoral pain. Their research also showed that the degree of tibial external rotation is greater than in those who have the patellofemoral pain. The researchers found that the physical limitations that dancers have, such as lack of flexibility, is positively correlated with an increase in knee pain. ITB tightness predisposes a dancer to patellofemoral pain, and when compensations are made to force turnout in dancers who have ITB tightness, the pain is exasperated (Winslow & Yoder, 1995).

Psychosocial Challenges with Dancers

Professional athletes have an incredibly small window to give everything they can to their sport. The physical demands are softened slightly by an offseason that allows for recovery. Professional athletes know that while they may only have a short period of time to play the game they love, they have a shot at making over a million dollars a year and being lauded by the general public (McGuire, 2013). But the money and fame are not enough to prevent injuries in

the athletes. The Williams and Anderson (1998) stress injury model examines the relationship between personality factors, history of stressors, and coping resources in relation to an athlete's stress response (See Appendix C Figure 1 for Williams and Anderson Stress Injury Model). The cognitive appraisal of these factors and the potentially stressful situation can lead to physiological and attentional changes, which affects the likelihood of injury. Athletes who suffer from high stress and anxiety levels are more likely to interpret situations as more distressing, which can increase physiological responses. Physiological responses to stressful situations include tensing up, loss of focus, and an increase in blind spots, all of which set athletes up for possible injury. Those who have been injured before are also affected by the fear of reinjury. Some athletes return to their sport before they are physically and psychologically recovered thus increasing their risk. History of stressors also includes events that are outside of their sport, but still have an effect on their performance, such as major life events and daily hassles. Coping resources, such as social support, stress management, appropriate sleeping patterns, healthy nutrition and diet, and proper medication, directly affect the vulnerability of an individual, as well as the injury outcome (Williams & Anderson, 1998). While the Williams and Anderson (1998) model primarily accounts for acute injuries, the personality traits can account for overuse injuries.

General stress arises from the relationship between an individual and her/his environment, but sports-related stress can be categorized as either competitive or organizational. Previous research has determined that the occupational stressors have stronger effects on the athletes, sometimes four times as much. Organizational stress can be categorized as performance, environmental, personal, leadership, and team issues (See Appendix D for Organizational Stressors). Performance can be further broken down into preparation, both mental and physical;

injury, especially risk of; opponents, specifically intimidation; self, which was body image; event; and superstition. Environmental stressors include selection, finances, training environment, accommodation, and competition and safety. The lack of clarity in selection and the use of the low income as a form of control were cited strongly (Hanton, Fletcher, & Coughlan, 2005). There is also the "pressure of training full time" (Hanton, Fletcher, & Coughlan, 2005, pg. 1136). Personal factors, such as nutrition, caused more stress for women in regards to dieting and lack of sensitivity from coaches. Frustration towards injury and goals and expectations of the individual and the coach are also classified as personal stressors. Team-related stressors were team atmosphere, support network, and roles and communication (Woodman & Hardy, 2001). The biggest stressor of these was the abuse of power from those in higher roles, such as coaches (Hanton, Fletcher, & Coughlan, 2005). Team members are required to spend long periods of time together, which can create tension in the atmosphere. Support networks, especially in case of injuries were important, because without the support, the injured individual felt isolated and used (Woodman & Hardy, 2001). These organizational stressors can lead to burn out of the sport or lead to physiological symptoms that can make the athlete vulnerable to injury.

Both the Williams and Anderson (1998) model and the organizational stressors can be applied to dancers in an effort to relate sports to dance and to better understand a form of athleticism that is often overlooked. Even though the Williams and Anderson (1998) model was made for general sport injuries, by placing dance factors into their categories, it can be seen the model is relevant for dance. Furthermore, emphasis can be placed on the personality factors, which can contribute to chronic or overuse injuries, such as compensated turnout (See Appendix C Figure 2 for Personality Factors) (Williams & Anderson, 1998). The need to be precise is

inherent of dance and dancers which can have negative consequences. As Hernandez (2012) writes, “The precise, advanced techniques for dance mastery, especially in ballet, frequently cause psychosocial stress and injuries. Perfection is also frequently cited as a characteristic of dancers” (pg.3). One individual says, “ballet is the art of perfection in which perfection can never be achieved” (McEwen& Young, 2011, pg. 157). McEwen and Young (2011) explored this and found that “a result of the pressure placed on dancers, in addition to their own drives to succeed, a hyper-critical and perfectionist attitude can develop where the dancer makes no allowances for flaws” (pg. 157). Both precision and perfection can lead to another personality factor: self-abusive behavior. Self-abusive behavior, also considered an addiction, refers to when “the dancer refuses to accept anything less than a perfect performance, even in training” (McEwen & Young, 2011, pg. 157). McEwen and Young (2011) compare this to athletes because dancers also “make sacrifices, strive for distinction, accept risks and refuse limits—practices that initially facilitate success but ultimately compromise health” (pg. 157). The fourth personality factor explored here encompasses the previous three: addiction to dancing. Despite the pain that can follow the self-abusive behavior dancers exhibit while overworking themselves in the names of precision and perfection, they do not want to stop dancing. Jeffery Russell (2013) comments, “Ballet dancers, in particular, exhibit a consuming passion for dance that makes a decision to stop dancing for injury or other reasons exceedingly difficult, a frame of mind Wainwright et al liken to an addiction” (pg. 201). These four personality factors can pressure dancers into pushing themselves too hard which contributes to the high rates of chronic injuries.

While history of stressors is considered to be more important in analyzing acute injuries, it can still provide valuable insight to chronic dance injuries. For instance, a previous injury or returning too early from a recovering injury can fall under the history of stressors category and

can lead to both acute or chronic injury. If an injury isn't properly healing, dancing again can create a chronic issue. (See Appendix C Figure 3 for History of Stressors). Coping resources are also helpful when working with dancers, especially looking at their social support, stress management, and diet (See Appendix C Figure 4 for Coping Resources). The careers are stressful and most peers are viewed as competitors. Because dancers are so accustomed to injuries, they may need more help coping with instead of ignoring pain.

Dancers can also be placed into the organizational stress categories for general sports (See Appendix D Figure 2 for Performance Stressors, Figure 3 for Environmental Stressors, Figure 4 for Personal Stressors, Figure 5 for Leadership Stressors, and Figure 6 for Team Stressors). Like athletes, dancers go through strenuous mental and physical *preparation* and deal with the apprehension of *injuries*. However, the *opponents* section of the performance category differs from athletes because dancers in a company all compete with each other for *roles*. As previously mentioned in the Dance Background section, dancers get *paid* very little which can be used as a form of control. Athletes and dancers both deal with pressure-filled *training environments.* Dancers, though, are especially vulnerable to the *nutrition* category because of the prevalence of eating disorders in the society. They also suffer from unrealistic *expectations* about their body image and dance technique. The *leadership* component for dancers can include the hierarchical structure and verbal harassment from their instructors. The *team atmosphere* for athletes is more similar to the opponent part for dancers due to the intense competition. These comparisons of dance and general sports show the similarities of the two in respect to stress and injuries. However, it is the differences between the two that can explain the higher injury rates in dancers.

Prevention

Previous research on prevention of athletic injuries has been tested in dancers and found

similar results. Social support and stress management appear to be the top two preventative measures. Supportive family, peers, and health care professionals make up an individual's social group. Athletes without those individuals have increased stress levels causing physiological reactions which raise the risk of injury. These reactions can decrease attention levels and tense up the muscles. Some forms of stress management that are beneficial for athletes and dancers alike include the program Stress Inoculation Therapy (SIT), diaphragmatic breathing, and progressive muscle relaxation (Noh, Morris, & Anderson, 2003). SIT refers to stress inoculation therapy that helps individuals prepare for stressful events, such as competitions (Mills, Reiss, & Dombeck, n.d.). Helpful coping mechanisms include imagery, positive self-talk, confidence training, countering, reframing, and goal setting. The individual's coping strategies and his/her support network also influence the injury response of athletes and dancers while his/her worries and confidence predict duration of recovery (Noh, 2005).

Before Injury

The social, cultural, physical, and environmental occupational stressors of dancers need to be addressed in an effort to decrease the negative response to stress. The psychological reactions to different work environment factors can have physiological reactions that can cause a variety of illnesses and injuries (Hernandez, 2012). Ballet requires perfection and precision that can create unrealistic expectations that can hurt dancers. Together with the advanced technique and competition from peers, dancers can develop a self-abusive addiction to dance. Dancers can be so hypercritical of themselves that they work themselves to the bone (McEwen & Young, 2011). Stage fright can also contribute to stress of the dancer (Hernandez, 2012). They are subject to the potential biases of their instructors and even verbal harassment that can in turn increase the need to be perfect (McEwen & Young, 2011). Dancers may also be exposed to incorrect teachings at some point in their career, which can have serious effects on their

progression. Dancers can also suffer from memory and cognition impairment due to the biochemical imbalances caused by prolonged stress (Hernandez, 2012). Dance includes a multifaceted culture that comes with risks and stressors apart from physical injury, that are still serious issues that can lead to an unhealthy dancer.

These serious issues are considered occupational risks. The hierarchical structure and competitive nature can contribute to the low self-esteem of dancers. Ballet is also plagued with eating disorders. There is such a focus on the body of a dancer that it is easy develop an unhealthy obsession with how they look (Russell, 2013). Dancers are also at risk for alcohol, drug, and cigarette dependency because of the stressful lifestyle (Hernandez, 2012). There is also risk of fatigue due to the intense schedule with little time off to relax (Russell, 2013). These occupational risks can make the dancer more vulnerable to injury.

During Injury

The occupational stressors and risks exist independent of any injury, but what occurs once pain or injury is detected must be explored. The period during the detection of pain and injury is separated by the perception of the pain, the mentalities that permeate the dance world, the barriers to reporting, and the feelings toward healthcare professionals. Coming to terms with injury, especially if it requires time off dance, is a serious and multifaceted process, and the decision to do anything in regards to injury is a difficult one. In general, the dance world is hesitant to report injury, even if it could be physically detrimental. Dancers are typically aware of the risks that they take when they continue dancing while injured, however, the risk is worth the reward to them. The fear of being unable to continue dancing outweighs the potential costs McEwen & Young, 2011).

The dance community is hostile towards injuries because they are limitations of the dancer (Air, 2013). Pain is considered an occupational hazard of dance and therefore dancers are

not supposed to complain about the challenges that come with this lifestyle (Krasnow, Kerr, & Mainwaring, 1994). The dance world maintains a mindset that pain must be expected, which has led to a "culture of tolerance" because the show must go on (Mainwaring, 2001, pg. 108). A "normalization of injury" occurs as it is not only expected, but is even seen as an opportunity to toughen one's body (McEwen, 2011, pg. 154). This mentality affects the body, as it is reported that dancers appear to have a higher pain threshold than non-dancers (Mainwaring, 2001). They are expected to push through any and all pain they incur (Rivera, Alexander, & Nehrenz, 2012). Dancing through pain is almost a badge of honor, as well as a necessity as professional dancers practice all day long, almost every day of the week, without the typical off-season of other sports (Russell, 2015). This "no pain, no gain" belief prevents dancers from listening to their bodies (Thomas & Tarr, 2009, pg. 51).

A source of confusion for dancers reacting to pain is the different types of pain they experience. Previous research categorizes athletes' perception of pain into hidden, disrespected, unwelcomed, and depersonalized. Hidden pain is the kind that gets ignored no matter the dangerous consequences. Disrespected pain is the everyday pain that gets ignored because pain is expected in sports and dance. Overuse injuries, especially those resulting from compensated turnout fit into both hidden and disrespected pain because it is a wear and tear injury over time that can be ignored for a period of time. Unwelcomed pain is ignored because reporting it does not go well with instructors and peers. Dancers fear they are letting their instructors down and are weak if they report pain. Depersonalized pain is when the person feels that their body betrayed them by being hurt. This can contribute to the low self-esteem in dancers and the self-abusive behavior they exhibit. Dancers also have a specific type of welcomed pain which is seen as a warning sign from the body. This pain can also strengthen the body and raising the

individual's threshold of pain (McEwen & Young, 2011).

Similar to the idea of welcomed and unwelcomed pain is the difference between good and bad pain. Good pain is muscular pain and bad pain is nerve pain, however the underlying difference is the quantity of the pain. The good pain is proof of improvement in the dancer while bad pain is the body saying that something is wrong. Despite the prevalence and different interpretations of pain, dancers do not always equate pain with injury (Thomas & Tarr, 2009). Dancers consider an injury as anything that prevented them from dancing to their full ability and because pain is so commonly ignored, pain and injury are seen as two separate entities (Reid, 1988).

Pain and injury are so commonplace that there are many phrases that reveal the mentality dancers have towards their pain. The most common is "the show must go on" which insinuates that the dancer can always be replaced (Krasnow, Kerr, & Mainwaring, 1994, pg. 8). If the lead is injured, the understudy will take her place and the original dancer will miss out on a performance. Other phrases are more focused on pain such as "work through your pain" and "transcend your injury" (Krasnow, Kerr, & Mainwaring, 1994, pg. 8). Ballet requires toughening up the body and while there is good and bad pain, the phrase does not differentiate and therefore ingrains a dangerous work ethic. The dance world has the belief in "no pain, no gain," which is preventing dancers from listening to their bodies (Thomas & Tarr, 2009, pg. 51). "Mind over matter" and "fact of life" underscore the potential issues that arise when ignoring the injury (Krasnow, Kerr, & Mainwaring, 1994, pg 8 & pg. 7). These phrases show the normalization of pain in the dance world which has created both a culture of risk and a culture of tolerance (Mainwaring, Krasnow, & Kerr, 2001; McEwen & Young, 2011). Dancers know they are likely to be injured but they are not supposed to let the injury hinder their career. If they do

they are seen as weak or uncommitted by their peers which can be psychologically detrimental and therefore dancers will try to ignore their pain for as long as possible (McEwen & Young, 2011).

Once the dancer is aware that their injury requires action, there are many barriers that prevent them from taking the next step. Professional dancers work all day long for usually six days a week and often work a side job to make ends meet (Dance National Arts Centre, n.d; Career Igniter, n.d). Therefore, most do not have the extra time and money to seek medical attention when they know it is needed. There is also worry of gaining weight if they take time off from dancing, especially if the injury will prevent them from working out as well as dancing. Dancers are consistently concerned with losing their place in their company (Krasnow, Kerr, & Mainwaring, 1994). There is always another dancer prepared to step up if one cannot perform, and if an injured dancer takes time off, they are not guaranteed to come back to the same position they held previously. Furthermore, the time off hurts their dance ability. When they return to their company they have to prove themselves and move back up to their position. Dancers feel an addiction to dancing due to the need to continually perfect themselves. This addiction to dance, coupled with the feeling of lack of appreciation from the general public, makes it harder for dancers to step away to let their body heal (Russell, 2013). It can be difficult for dancers to come to terms with an injury when their atmosphere encourages working through pain both mentally and physically in preparation for competition.

One of the biggest barriers to reaching out for help is the mistrust dancers have for healthcare professionals. Dancers sometimes feel inadequately treated. They do not feel as though doctors understand them if they do not have a dance background (Russell, 2013). This lack of trust fuels the negative feelings dancers have about their injury and can discourage them

from seeking medical attention (McEwen & Young, 2011). They worry that the doctors will not understand how time off from work could seriously impair their career (Mainwaring, Krasnow, & Kerr, 2001). Dancers deem that prescription as "both traumatic and impossible to follow" (Krasnow, Kerr, & Mainwaring, 1994, pg. 8). Instead, dancers use alternative therapies more in line with their alternative lifestyle, such as "acupuncture, massage, herbal treatments, [and] special diet" (Krasnow, Kerr, & Mainwaring, 1994, pg. 8). But above all the barriers to reporting injuries to teachers or doctors is the realization of the dancer's personal fear. The ability to ignore an injury disappears once a dancer goes to a doctor. One of the biggest fears a dancer has is that the injury could end their career in dance, and reporting that injury may make the fear too realistic for the dancer to handle (Krasnow, Kerr, & Mainwaring, 1994).

Recovery

Dancers experience anxiety reporting their injury to their teachers, directors, and peers. They can become distressed while watching classes or performance where they must sit out. While taking time off to rehabilitate, there is often a concern of weight gain, and a correlation between injury and eating disorders has been discovered (Mainwaring, Krasnow, & Kerr, 2001). Without proper coping techniques, dancers can experience psychological distress and become depressed and have suicidal thoughts (Mainwaring, Krasnow, & Kerr, 2001). Those who are injured feel betrayed by their body, blame themselves, and start to struggle with their identities (McEwen & Young, 2011). Dancers who take time off to heal feel pressured to return to dance without completely healing which can trigger emotional pain. Dancers who feel pressured to push through the pain are less likely to rehabilitate out of fear of missing out on upcoming roles (Rivera, Alexander, & Nehrenz, 2012). Mary Elizabeth Air (2013) administered the Brief Symptom Inventory 153 times to study the psychological symptoms of injured dancers. The survey was taken by those who were at their first doctor's appointment, and those at their last

appointment. Dancers at their first appointment exhibited distress higher than average for 90% of the symptoms, and the percentage only dropped to 50% for those on their last visit. Sixty percent of the dancers scored high enough to be referred to a psychologist. The participants on average exhibited four psychopathological symptoms, including somatization, cognitive troubles, depression, anxiety, phobic anxiety, paranoid ideation, and psychoticism. Nearly fifty percent scored "above average" psychological distress, and nearly twenty percent scored "high" or "very high" (Air, 2013). This study demonstrated that anxiety during recovery, and this stress can hamper the rehabilitation of the injury (Hernandez, 2012). Dancers without proper coping skills or a support system are more likely to suffer from negative emotions during their recovery. And for some dancers, no amount of recovery will allow them to return to ballet.

The psychological and physical elements of dance are ever-present can trap dancers in a painful cycle. Psychological and social pressure can intimidate dancers to make technique flaws, such as compensating their turnout. Dancers' vulnerability from occupational stressors and risks is increased when they make a purposeful mistake, such as compensating their turnout. Eventually the body sends warning signals in the form of pain that it cannot continue moving in the way the dancer wants their body to perform. The dancer then struggles with how to react to the pain: push through or report. With all the aforementioned barriers, a dancer will push through pain until their body forces them to quit. The distressed dancer must then report pain to their instructors, peers, and doctor. The stress and anxiety a dancer experiences while reporting and while taking time off to recovery pressures her to return to dance as soon as possible, often too soon (Rivera, Alexander, & Nehrenz, 2012). If a dancer returns before she is fully rehabilitated she increases her chances of reinjury and thus can be doomed to repeat the same process she just went through (Williams & Anderson, 1998). This entrapping process is known as Physical-

Psychosocial Injury Cycle, developed through this study by comparing previous research on ballet turnout and psyche. (See Appendix F for Physical-Psychosocial Injury Cycle).

Data

Methods

After receiving approval from the University of Tennessee at Chattanooga Institutional Review Board, an online anonymous survey was conducted to determine perceived pressure of dancers. The survey was created through UTC Qualtrics and was distributed using the snowball method. Initial posts were made on social media accounts Facebook and GroupMe and participants were asked to share the post/link for the survey. Dance studios were also contacted via email to distribute the survey. All participants were at least eighteen years old. The purpose of the survey was to study first-hand accounts of perceived pressure from dancers themselves and compare those results with those from the literature. The survey was also used to gauge how turnout was used in dance and if there was any pressure attributed to developing the ideal turnout. (See Appendix E for Survey Results)

Demographics

The forty-seven participants of the survey had an average thirteen years of dance experience within a range of two-to-thirty-eight years. The average age for starting dance was six with the youngest being two and the oldest being sixteen years old. Forty-five of the forty-seven participants took ballet classes during their dance careers. Contemporary/modern and Jazz were the second (79%) and third (74%) most taken genre of dance. When asked how serious of a dancer they considered themselves to be, 31% stated they were interested in pursuing a profession in dance. The most prevalent answer (39%) was that dance was a priority for them.

Questions

All but one dancer answered that they were familiar with the term turnout (98%). Dancers were then asked to describe turnout in their own words. In the forty-seven responses, turnout was associated with ballet and a certain amount of degrees three times each. First position was referenced once. The majority of answers focused on the physicality of turnout which can be placed into three categories: muscles, limbs/joints, and the directional category of turn out, rotation, and outward. Muscles were mentioned nine times both in general terms and specifically naming rotators, adductors, and flexors. Limbs/joints were mentioned the most out of the responses, totaling 83 times. Hips were reported 25 times followed by legs at 22 and foot at 15. Other terms used were knee (6), thigh (2), glutes (2), toes (4), heel (2), femur (1), ankle (3). One answer said turnout involves the center of the body. The answers that included directional instructions totaled 38 mentions. Finally, one dancer defined turnout as a result of dancing and another as "practically impossible."

Sixty-eight percent of the participants said they used turnout out most of the time. For those who used it sometimes, half the time, or none it can be assumed that they partook in a genre besides ballet. It was then asked if their instructors ever discussed compensated or incorrect turnout, to which nearly 90% said yes. Furthermore, 72% said that their instructors made a point to discuss the correct form of turnout and to correct it regularly. These answers are important because they show the awareness of compensated turnout in dance and that the instructors take it extremely serious. Over half the dancers answered that there were no rewards for achieving a perfect turnout. Despite this, 70% of the participants said that did feel pressure to have a perfect or better turnout. This perhaps can be internal pressure to push themselves to perfection or peer pressure to keep up with the competition. The dancers were then asked to check off which different types of pain that they attribute to compensated turnout. Knee pain was the most

prevalent at 30%, followed by hip pain at 17%, back pain at 14%, and ankle at 12%. These results are similar those of previous studies. Thirteen participants stated they experienced no pain to compensated turnout.

Dancers were also asked about the perceived pressure they were under while dancing, specifically relating to injury. When asked "Did you always report any pain or injury to your dance instructor," 53% of participants said no. While less than half of the dancers reported pain, 55% of the group said that they did not feel pressure to not report their injury. Twenty-seven percent said they felt "somewhat" pressured to hide their injury. These two questions appear to point to internal pressure of the dancers, as opposed to external atmospheric pressure. However, the results to "Did you ever feel pressure to continue dancing despite pain or injury?" had the opposite results with nearly 60% saying yes and 28% saying somewhat. This can be attributed to the competitive atmosphere of dance, as well as the individual's passion for dance. The dancers were then asked to determine to what degree they experienced mental/social/professional pressure in the dance atmosphere. Forty percent said that the pressure affected choices they made as a dancer. Thirty-eight percent said that they noticed the pressure but it did not have any lasting effects. Nineteen percent said that there was heavy pressure but it did not affect the choices they made.

Limitations

For brevity, the survey included broad questions and only one open-ended question. This was done to encourage participants to finish the survey, however it does lead to some limitations. The broad questions allowed dancers room for interpretation or possible misunderstanding. Also this study would have benefitted from more open-ended questions for dancers to expand on their experiences. This was a short survey as well which limits the amount of knowledge to be gleaned.

Another limitation is that the survey was open to all dancers because turnout is used in more than just ballet. However, several of the genres of the participants do not use turnout and therefore could have skewed the results. Future similar studies should allow different questions for different genres and then the results could better be compared within and among the different genres.

With only forty-seven participants it was also a small sample size, even though it was a broad population. A greater pool of answers could show stronger patterns in answers. Also it could be helpful to categorize questions based on ages to see if there has been a change in dance pressure and education over the years.

Discussion

The results of the survey suggest that the dancers who use turnout are very aware of what the term means and the importance of proper form. It seems while their instructors and studio make a point to emphasize the importance of correct turnout, dancers still feel pressure to compensate. This pressure comes from the perfectionist characteristics of dancers who always push themselves to be better. So while they may not receive explicit rewards for better turnout, there is an ingrained pressure that turnout reflects on their ability as a dancer on a whole. These results are encouraging because the education and support of the instructors is growing and will hopefully lead to new generations of dancers who do not compensate their turnout.

The questions about perceived pressure had interesting results that point to internalized pressure. The dancers reported injuries less than half of the time but did not feel outside pressure to hide their injury. Furthermore, most of the respondents admitted that they felt pressure to continue dancing when injured. This could be due to set backs in their career if they took time off, loss of a role, feeling weak in front of their peers, or simply their love of dance and the adrenaline from performing.

This study indicates dancers have internalized pressure to compensate their turnout which leads to pain and injuries that dancers are then hesitant to report. These steps are the beginning of the Physical-Psychosocial Cycle because their physical body gets caught in the crossfire between pushing themselves and being pushed by their competition.

Physical-Psychosocial Cycle

The psychosocial pressure of athletes and dancers and their physical well-being are intricately intertwined, with the two locked into a constant cycle. The intense pressure that comes with sports and dance cannot be overstated, especially since the stress can have physiological manifestations. Athletes and dancers have strenuous physical demands, work in competitive atmospheres, and have relatively short careers. The physical and psychosocial demands work in sync, therefore, when one pressure begins to negatively affect the athlete, a consequential demand will also affect the athlete (Noh, Morris, & Anderson, 2003). Thus, dancers are trapped in the physical-psychosocial injury cycle in which each demand has a worsening consequence. (See Appendix F for Physical-Psychosocial Injury Cycle).

All athletes have a fear of injury, however, dancers do not have an offseason to rest their bodies and rehabilitate any injuries (Woodman & Hardy, 2001; Mainwaring, Krasnow, & Kerr, 2001). Ballet may be an art, but ballerinas are athletes who spend their entire lives training hours on end, year after year. The lack of rest makes dancers vulnerable to injuries, which is why they have such high injury rates (Dance Facts, n.d.). The physical demands are compounded with the competitive atmosphere of the professional dance world. Moreover, injuries are seen as a dancer's greatest weakness (Air, 2013). And like professional athletes, dancers also have to account for how short their career is and must push themselves as hard as they can to get as much out of their career as they can before their body forces them into retirement (Dance Facts,

n.d.). These three factors pressure dancers to make decisions that can trap them in the physical-psychosocial injury cycle in which dancers injure themselves.

Steps 1 & 2: Psychosocial Pressure & Physical Consequence

The physical-psychosocial cycle begins with the psychosocial pressure. Ballerinas strive for perfection and therefore suffer from unrealistic expectations about body image and dance ability (Hernandez, 2012), such as having 180^{o} turnout, which according to one of my survey participants is "practically impossible". The prevalence of turnout surrounds ballerinas with pressure to stand in the best possible turned out position (Champion & Chatfield, 2008). The stress from this pressure can affect the immune system and lead to illness and chronic dance injuries and pain (Hernandez, 2012). The injuries can occur due to the physical or hormonal effects of stress, or the "emotional, social, intellectual, spiritual, psychological, [or] philosophical" effects can distract the dancer and make them more vulnerable to mistakes that can cause injury (Hernandez, 2012, pg. 3). In the case of turnout, dancers who feel they do not have the necessary turnout feel pressure to compensate their turnout, thus making a technical mistake that disrupts the body's natural movement. Dancers know the risks they are taking when they ignore their body but believe it is worth it because of the belief that "dancing is not something you do, it is something you are" (McEwen, 2011, pg. 168). This is supported by 70% of my survey respondents who said they felt pressure to have a better turnout. They knew it could hurt them, but they still made the conscious decision to make a technical mistake. Therefore, the psychological pressure of turnout in ballet leads to pain.

Step 3: Psychosocial Struggle

The detection of physical pain triggers a second psychosocial segment: the internal psychological struggle. Dancers must wrestle with atmospheric mentalities that stand as a barrier to reporting and getting help for their injury. The most common dance injuries are wear-and-tear,

the same kind compensated turnout can lead to (Thomas & Tarr, 2009). Wear-and-tear injuries occur in joints, ligaments, and muscles as the dancer continues to use them without giving herself time to rest. These overuse injuries grow greater over time and are therefore easier to ignore for longer periods of time, as opposed to a traumatic injury in which the dancer physically continue. Dancers therefore stave off the judgment of their community about this physical restriction for as long as possible. My survey shows that over 50% of the participants did not report pain or injury to their instructor to avoid dealing with the consequences. Dancers often believe that hard work and perseverance will create the perfect body, and ballet is a world of hypercritical perfectionists (McEwen & Young, 2011). This belief is reflected in the phrases and sayings discussed previously. When dancers have spent their whole life in a "culture of risk" it can be difficult process their body telling them something is wrong (McEwen & Young, 2011, pg. 152). And even if there is pain or injury it is seen as normal. Even seemingly harmless mantras such as the "show must go on" is layered with reminders that a dancer is replaceable and if she cannot keep up, she will miss out (Krasnow, Kerr, & Mainwaring, 1994, pg. 8). This phrase is filled with internal and external pressure to the point that a dancer will perform despite injuries.

Step 4: Physically Prolonging the Pain

Some of the logistical reasons dancers don't go seek medical assistance is due to lack of time and the financial burden. There is no off-season in dance; therefore, they cannot consider time off from their profession without serious costs to their career (Mainwaring, Krasnow, & Kerr, 1994). Both financially and career-wise, dancers can't afford to take time off their job (Krasnow, Kerr, & Mainwaring, 1994). Along with treatment, injured dancers also have to pay for "prescription drugs, alternative therapies, cost of transportation to and from therapy, supplies, and associated loss of income due to time lost from work." (Krasnow, Kerr, & Mainwaring,

1994, pg. 7). Dancers acknowledging their injury is difficult enough without having to go outside of the dance world for help, especially when the dance world is a difficult space to navigate. This is supported by 60% of my survey participants stating that they felt pressure to continue dancing despite pain or injury. These fears and the stress the dancers experience only add to the physical pain they are suffering from. Pressure hurts the dancer and more pressure still causes psychosocial stress while she decides how to handle the pain. During this internal struggle, dancers are still performing and worsening the physical pain.

Step 5: Psychological Distress

The exacerbated pain is usually the point at which the dancer must begin some sort of physical rehabilitation. Rehabilitation requires taking time off dance which triggers psychological distress in the dancer because they are being asked to place their identity on hold. (Krasnow, Kerr, & Mainwaring, 1994). Those who feel pressured to push through the pain are less likely to rehabilitate out of fear of missing out on upcoming roles (Rivera, Alexander, & Nehrenz, 2012). There is also the struggle of being forced to sit out of class. Mainwaring, Krasnow, & Kerr (2001) write, “dancers also experienced anger, guilt, and distress about watching others dance,” (pg. 108). While taking time off to rehabilitate, there is often a concern of weight gain, and a correlation between injury and eating disorders has been discovered (Mainwaring, Krasnow, & Kerr, 1994). Being a dancer is an integral part of their identities and their distress can manifest as self-hate as they blame themselves and their body for hindering their passion. (McEwen & Young, 2011). Dancers need proper coping techniques to avoid their psychological distress experienced rehabilitation. If not treated properly, the psychological stress can worsen and turn into depression or suicidal thoughts (Mainwaring, Krasnow, & Kerr, 1994). A sixteen-year-old and an eighteen-year-old were interviewed about their injury period. The authors write that,

> Both dancers experienced coping difficulties that resulted in psychotraumatic distress, manifested by an attempted suicide in one case and depressive episodes and disordered eating in the other. One of the dancers also went through bouts of self-mutilation, in the form of self-cutting, and used clothing to hide the symptoms. (Mainwaring, Krasnow, & Kerr, 2001, pg. 108).

While these are on the extreme end of the spectrum, it shows how important coping techniques are to dancers. It is also valuable insight into the dancer psyche as they go through rehabilitation.

Step 6: Physical & Reentering the Cycle

The physical-psychosocial cycle can be applied to sports and dance, however, the personality factors typical of dancers as well as the authoritarian atmosphere magnifies the psychosocial pressure, which in turn increases the physical demands. Furthermore, dancers do not feel appreciation from those outside their environment and do not trust healthcare professionals the way other athletes do because of the differences between dance and other sports (Russell, 2013). It is easy for a dancer to slip into and get stuck in this cycle because they are unable to take time off to allow their body to completely heal (Russell, 2013). Dancers are also susceptible to a multitude of other stressors discussed earlier that add to the pressure they must suffer under. These stressors, including pressure to compensate turnout, lead to pain which leads to an internal struggle thus giving the pain time to worsen. The exacerbated physical pain then leads to more psychological anguish during recovery which can further pressure a dancer to return to dance too early. Mary Elizabeth Air (2013) noted that either the "psychological recovery may be slower than physical recovery," or "there is a discrepancy between what doctors and dancers consider to be 'end-of-treatment,' since the end of medical treatment is not synonymous with return to 100% of pre-morbid dance level" (pg. 115). Even if they are healed—which only occurs if the dancer finishes her rehabilitation—the dancer is not at the level

she/he used to be which could result in them dancing at a more advanced level than they are ready for. Returning to dance before being completely ready takes the dancer back to *Step 1*, and thus re-enters the cycle. It is crucial to break this cycle to lower the injury rate of dancers.

Conclusion

Comparatively, dance literature is sparse in regards to the psyche of a dancer and rates of injury. This can partly be explained by the fact that it is often not considered part of mainstream sports. The unique combination of art requiring athletic abilities sets it apart from its counterparts. In addition, dance is a subculture of its own, and understanding this background is critical in exploring any aspect of dance, including injury. My own experience as a dancer has been invaluable in researching the psychology of an injured dancer. I have been able to relate to almost every factor mentioned by the literature as causes for injury. By completing this study, I have only scratched the surface of the psychology of the dance world but I have also learned how universal my own experiences are to others in the field.

This study sheds light on the psychological pressures that come with dance and are often overlooked. Physical rehabilitation is more than just a physical process; therefore, it cannot be assumed that all injuries are purely a physical incident. Research shows that dancers are well aware of how their decisions are affected by the pressure they are under. They also fully understand correct technique, including turnout, according to my survey. So, while education on turnout and psychological pressure of dance is important, it is not the best route to take to lower the injury rate. Before suggestions can be made in an effort to lower the rate at which dancers get injured, a brief examination of the barriers must be done.

Dancers know they risk injury everyday; in fact they appear to know in exact detail what they are doing that can lead to injury, but that does not dissuade them. The biggest barriers

researchers need to understand if they are to work with dancers is the lack of offseason, atmospheric mentalities, and personality factors. The lack of an offseason is not something anyone could feasibly change because dancers must stay in shape and in top-notch performance mode at all times. Time off sets a dancer back and forces her to play catch up. Arguably more important is that dancers are paid to perform and if companies stopped putting on performances, dancers lose income.

The atmospheric mentalities and personality factors are also not changed easily, but perhaps are the best starting place. The two go hand-in-hand, with certain personalities being attracted to the dance world. Much of the atmospheric mentalities stems from serious concerns that are not easily alleviated, such as the competition for roles. Personality factors can also not be simply modified to create a safer environment. However, the relationship dancers have with injuries could potentially be the best way to address the high injury rates.

After reviewing literature and collecting data, I have developed suggestions to lower injury rates of dancers. The distrust of healthcare professionals could be lessened if dance companies established a relationship with local healthcare professionals. The doctors and physical therapists could make regular visits to rehearsals and become better accustomed to the movements of the dancers. Dancers would then feel more comfortable discussing rehabilitative options with the doctor because they know that the doctor understand their predicament. Studios could also provide incentives for getting physicals, or work with the healthcare professionals to develop more dance-specific physicals. This could keep dancers performing at their best ability and give them an opportunity to mention any pain they are having. This does not take away from practice time or cost any extra money for the dancer. The easy access could prevent *Step 4* of the Physical-Psychosocial Injury Cycle, the prolonged pain while deciding to report. It would also be

prudent for dance companies to work with mental healthcare professionals by providing onsite mental health workshops at regular time intervals. While this would not decrease pressure, it could teach dancers and instructors stress reduction and coping mechanisms. This could in turn ease the psychological distress of *Step 5*. The results of this study are not only resourceful for dancers and companies, but also healthcare professionals. Dancers cannot be treated for injuries in the same manner in which other athletes are treated.

Future research should involve implementing pilot relationships between dance companies and healthcare professional. Dancers should be interviewed to determine their perceived psychological pressure and their feelings towards injury. Using the Physical-Psychosocial Injury Cycle, the researchers should monitor dancers who fall into those steps and take preventative measures to keep the dancers from entering the next step of the cycle. Researchers should note if and how utilizing mental health workshops and personal relationships with doctors in breaking the injury cycle. The Physical-Psychosocial Injury Cycle should be further tested in larger population samples as a way to lower injury rates. Studies that can categorize injured dancers in certain steps are better prepared to help them. Ultimately, future research should focus on understanding the cycle, the culture that motivates these behaviors, and look for ways to prevent future injuries. This study combines information about turnout-related injuries and the psychological pressures of dancers and future studies should also work to see how these two factors are further intertwined.

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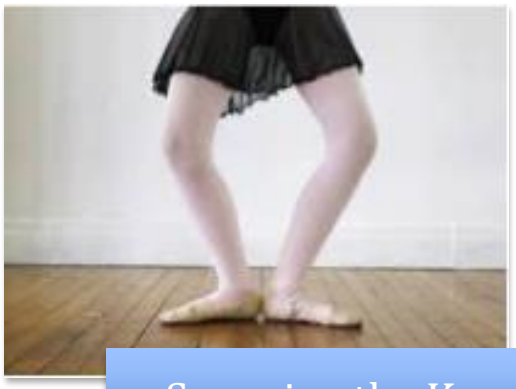
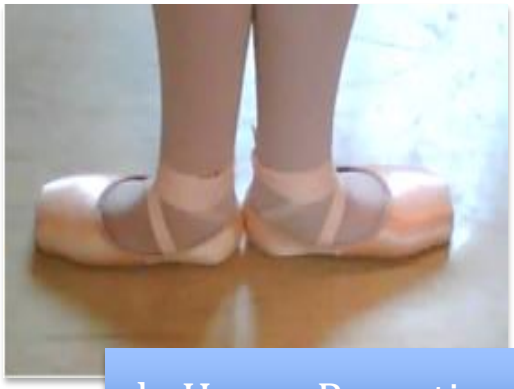
Appendix A Types of Turnout

a. First position with the ideal 180^{o} turnout in correct form (The Healthy Dancer, n.d.).
b. First position with less turnout which is still correct but not ideal (Hampton, 2011).
c. Shows the compensated turnout, pronation, in which the inner foot must roll onto the floor to maintain balance of the forced turnout. This is incorrect and can lead to injury (Baiano, 2008).
d. Shows the correct use of the stylistic term of turnout, in which the legs and knees face outward but are not in first position (Pajdak, 2011).

Appendix B Types of Compensations



a. Screwing the Knee

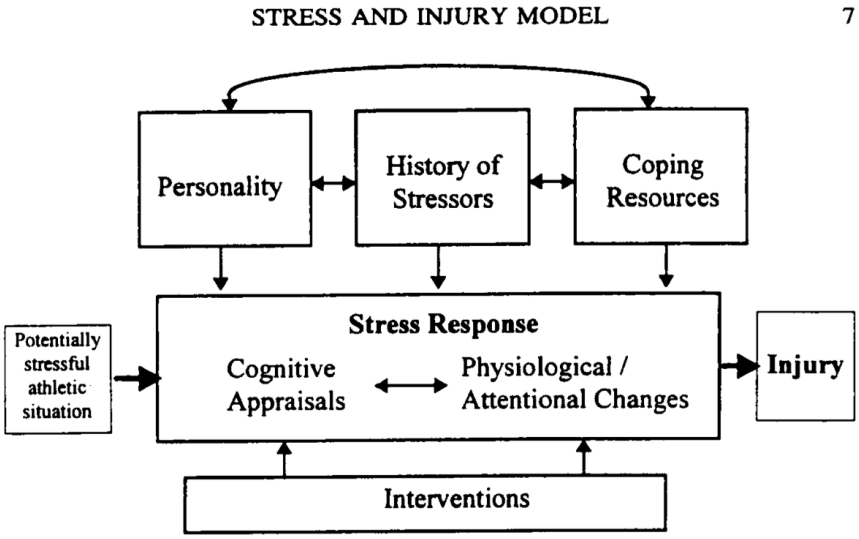


b. Hyper-Pronation

a. Screwing the knee is a form of compensation in which the dancer stands in first position, bends her knees, and forces her feet into the position she desires. This is a dangerous position and can lead to injury (Offbeat Ballerina, 2013).
b. Hyper-pronation is a form of compensation in which the dancer forces her turnout as far she can. In order to maintain balance, the dancer then rolls onto her feet. This is a dangerous position and can lead to injury (Dunn, 2014).

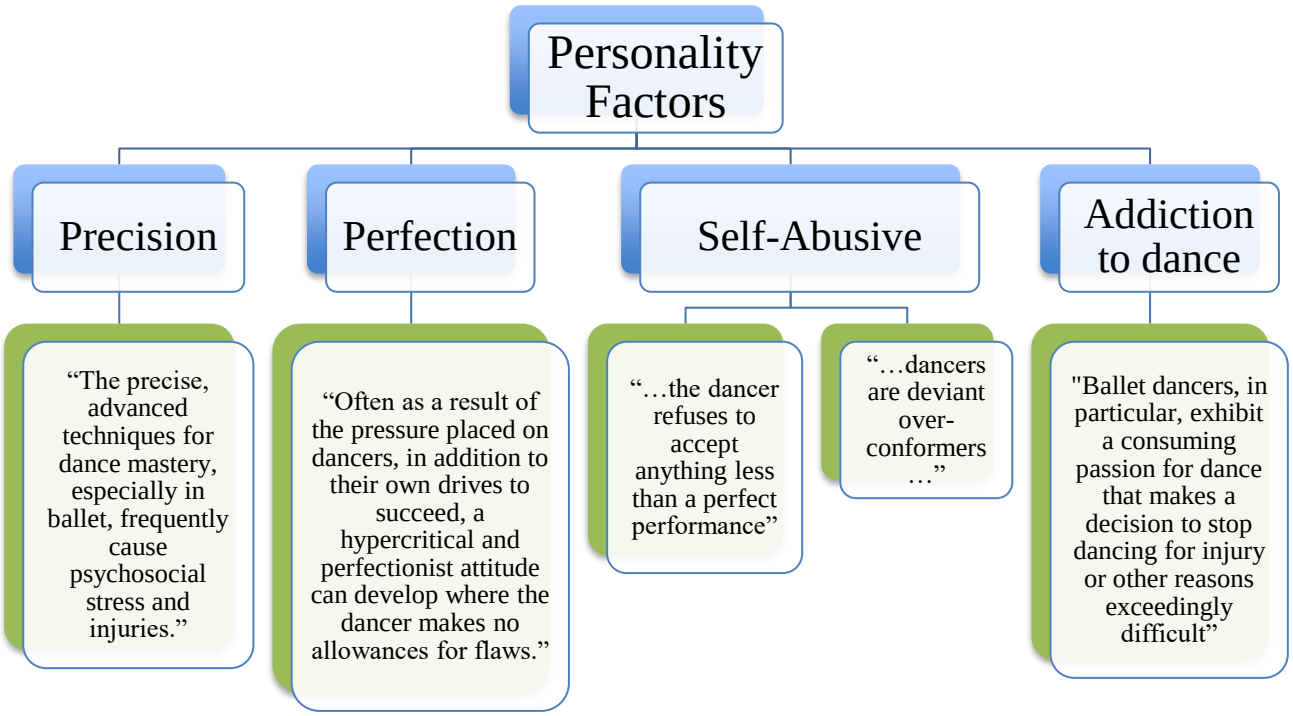
Appendix C Williams and Anderson Stress Injury Model

Figure 1 Original Williams and Anderson Stress Injury Model



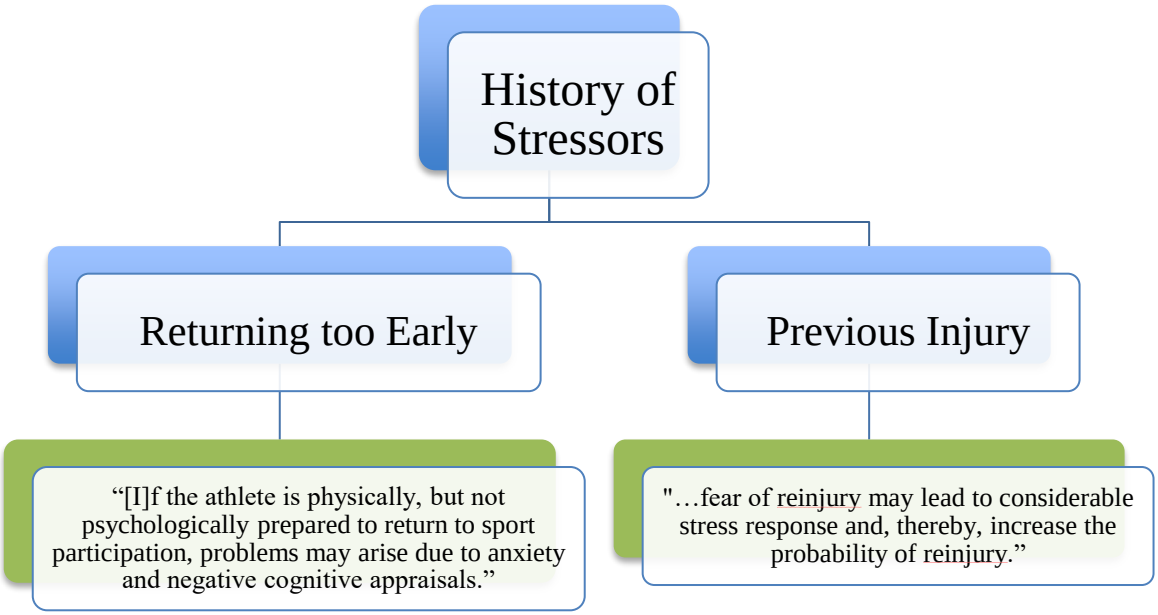
The Williams and Anderson Stress Injury Model shows how the personality, history of stressors, and the coping resources of the athlete determine her/his stress response to an event. This in turn determines whether or not the athlete could suffer an injury. This model can be used to intervene to prevent injury. (Williams & Anderson, 1998)

Figure 2



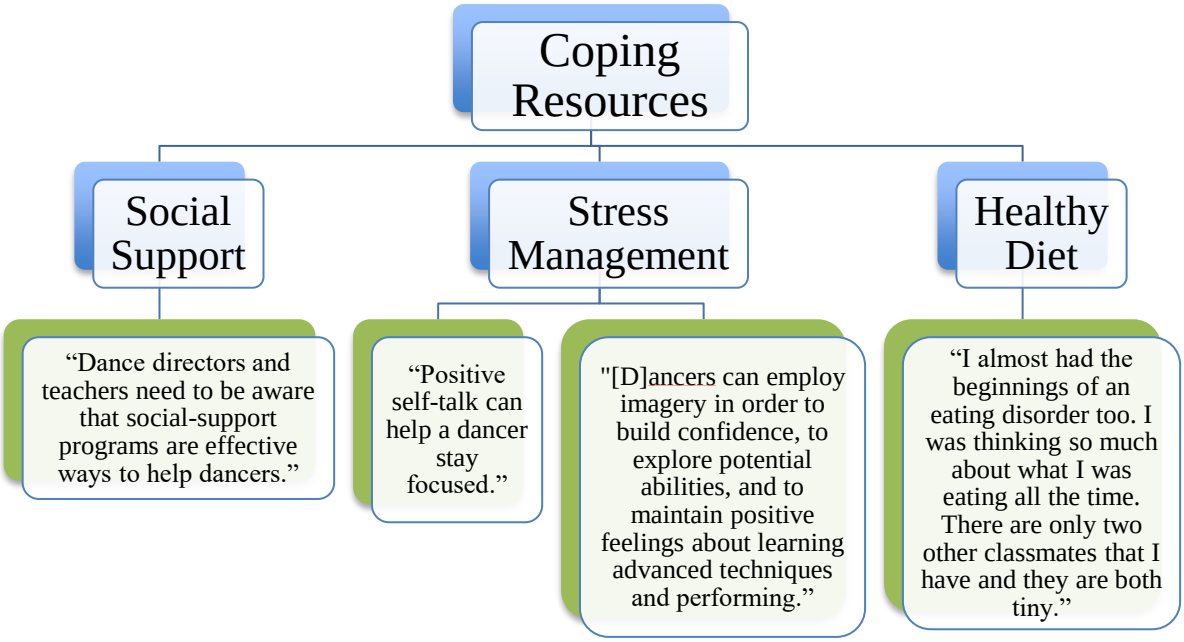
The personality factor part of the Williams and Anderson Stress Injury Model (1998) was applied to dance literature. The quotes in green are from the literature and provide examples of the dance personality factors. (Hernandez, 2012, pg. 3; McEwen & Young, 2011, pg. 157; McEwen & Young, 2011, pg. 157; Russell, 2013, pg. 201)

Figure 3



Returning too early to dance after an injury and previous injury are two dance-specific histories of stressors that can be applied to the Williams and Anderson Stress Injury Model. The quotes in green explain how those events can lead to injury. (Williams & Anderson, 1998, pg. 11)

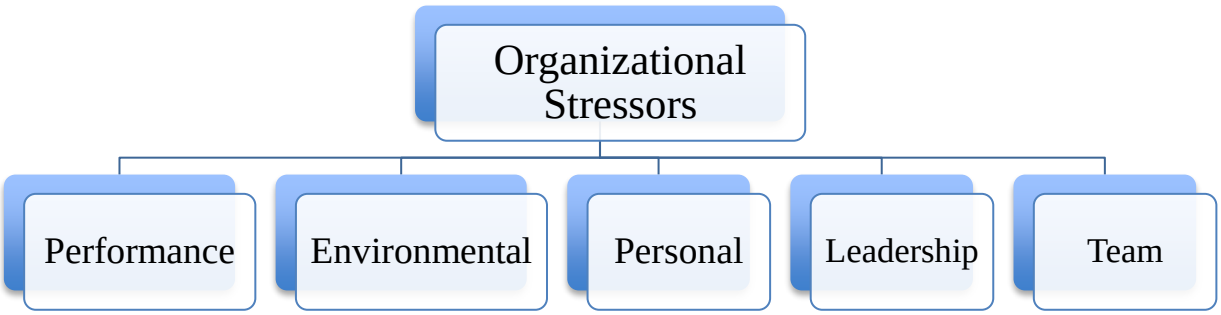
Figure 4



Social support, stress management, and healthy diet are three examples of coping resources that would be beneficial to dancers. The quotes in green are from the literature and provide examples of the dance coping resources. (Noh, Morris, & Anderson, 2003, pg. 39; Noh, Morris, & Anderson, 2003, pg. 39; Noh, Morris, & Anderson, 2003, pg. 38; McEwen & Young, 2011, pg. 167)

Appendix D Organizational Stressors

Figure 1 Original Organizational Stressors

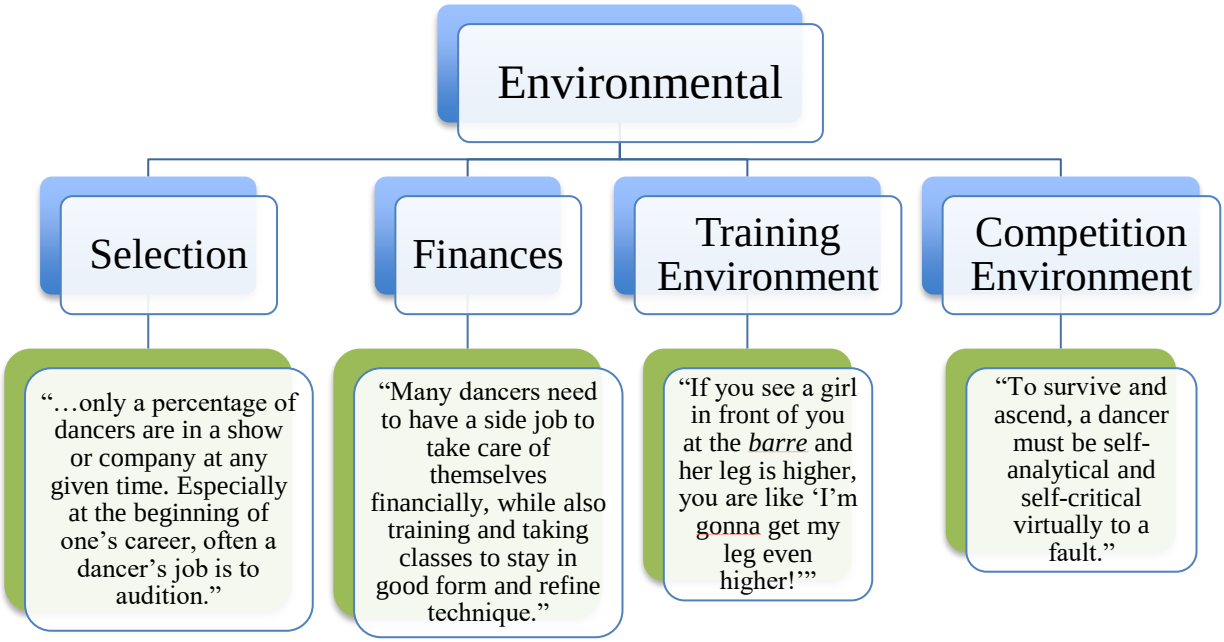


Organizational stressors can lead to injuries in athletes. The above five categories can be further broken down. These categories were determined by interviewing athletes on what causes the most stress in their lives (Hanton, Fletcher, & Coughlan, 2005; Woodman & Hardy, 2001).

Figure 2

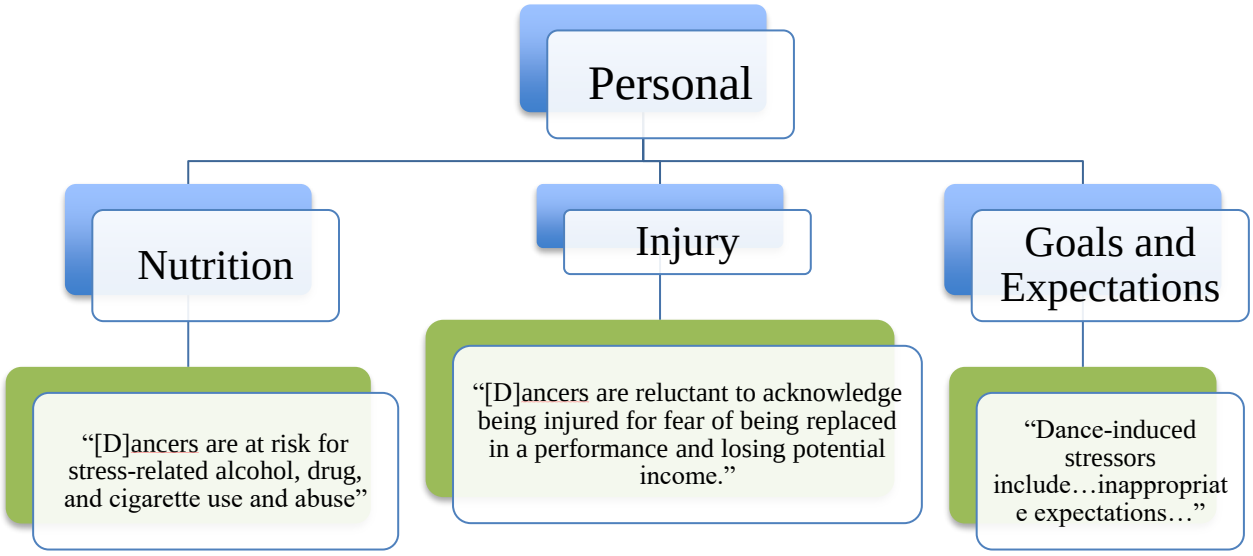
Mental and physical, injury, opponents, self, and events are all original categories under Performance in the Organizational Stressors Model. The quotes in green are dance-specific examples from the literature for each of the above categories. (Dance National Arts Centre, n.d.; Krasnow, Kerr, & Mainwaring, 1994, pg. 7; McEwen & Young, 2011, pg. 163; McEwen & Young, 2011, pg. 163, Mainwaring, Krasnow, & Kerr, 2001, pg. 105)

Figure 3



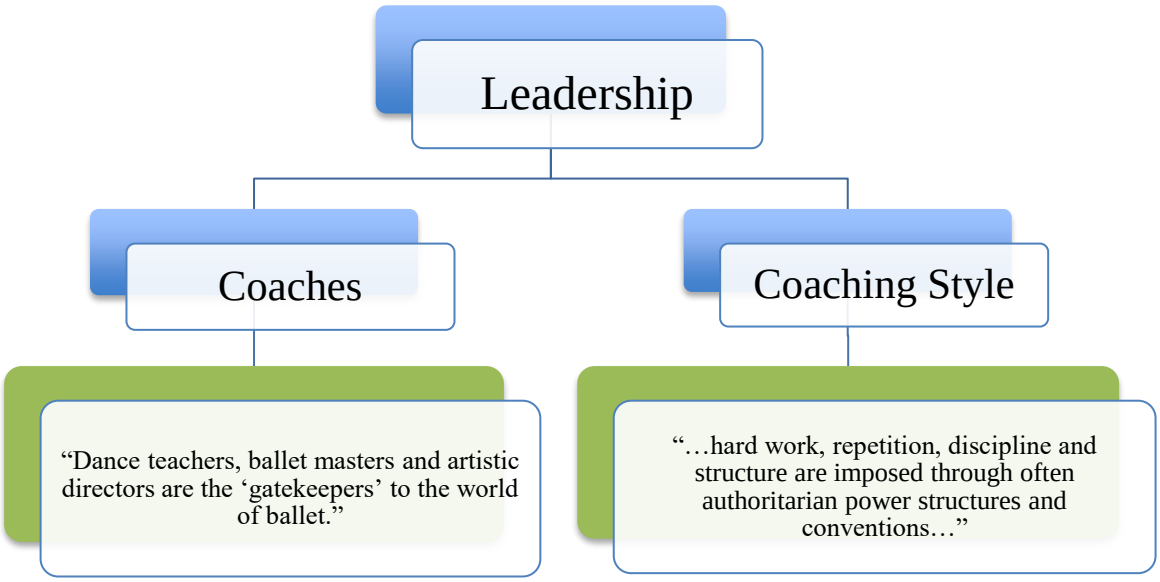
Selection, finances, training environment, and competition environment are the original categories under Environmental in the Organizational Stressors Model. The quotes in green are dance-specific environmental factors. (Career Igniter, n.d.; Career Igniter, n.d.; McEwen & Young, 2011, pg. 156; Mainwaring, Krasnow, & Kerr, 2001, pg. 110)

Figure 4



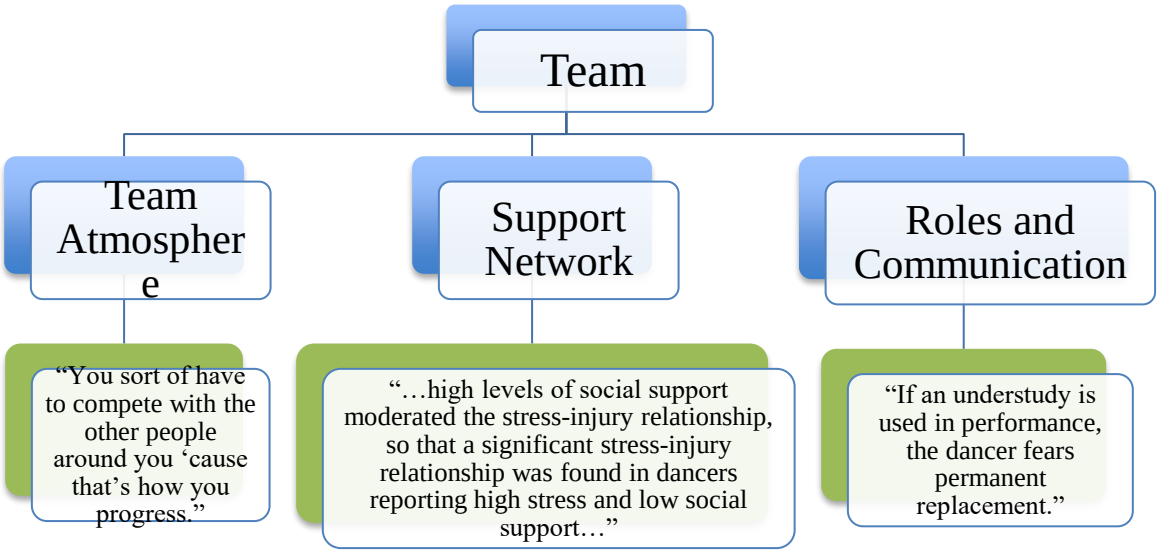
Nutrition, injury, and goals and expectations are the original categories under Personal in the Organizational Stressors Model. The quotes in green are examples of dance-specific personal factors. (Hernandez, 2012, pg. 3; Mainwaring, Krasnow, & Kerr, 2001, pg. 105; Hernandez, 2012, pg. 3)

Figure 5



Coaches and coaching style are the original categories under Leadership in the Organizational Stressor Model. The quotes in green are dance-specific examples of Leadership stressors. (Aalten, 2005, pg. 9; McEwen & Young, 2011, pg. 167)

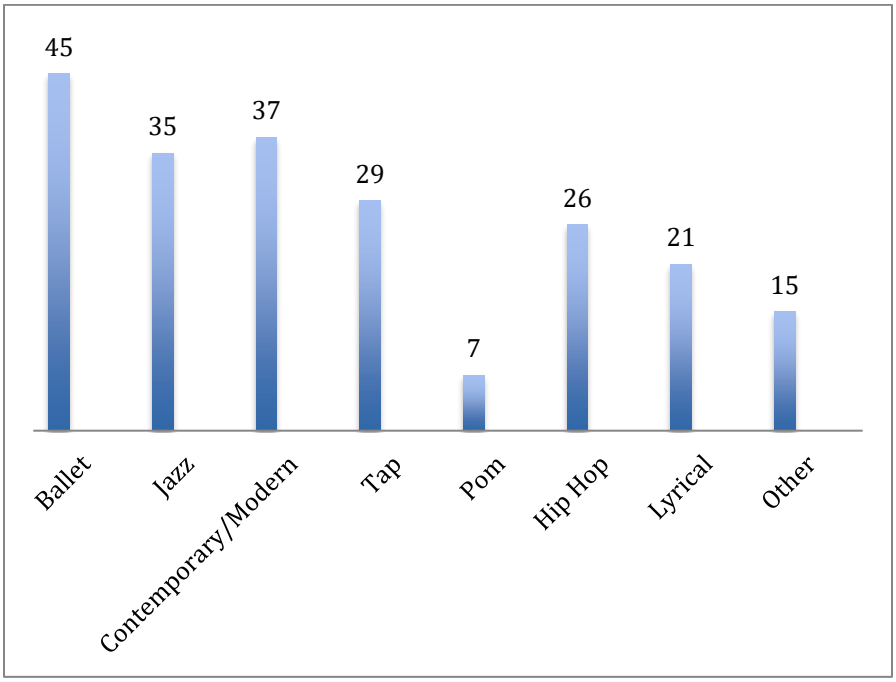
Figure 6



Team atmosphere, support network, and roles and communication are the original categories under Team for the Organizational Stressors Model. The quotes in green are dance-specific examples of Team tressors. (McEwen & Young, 2011, pg. 156; Noh, Morris, & Anderson, 2003, pg. 37; Krasnow, Kerr, & Mainwaring, 1994, pg. 8.)

Appendix E Survey Results

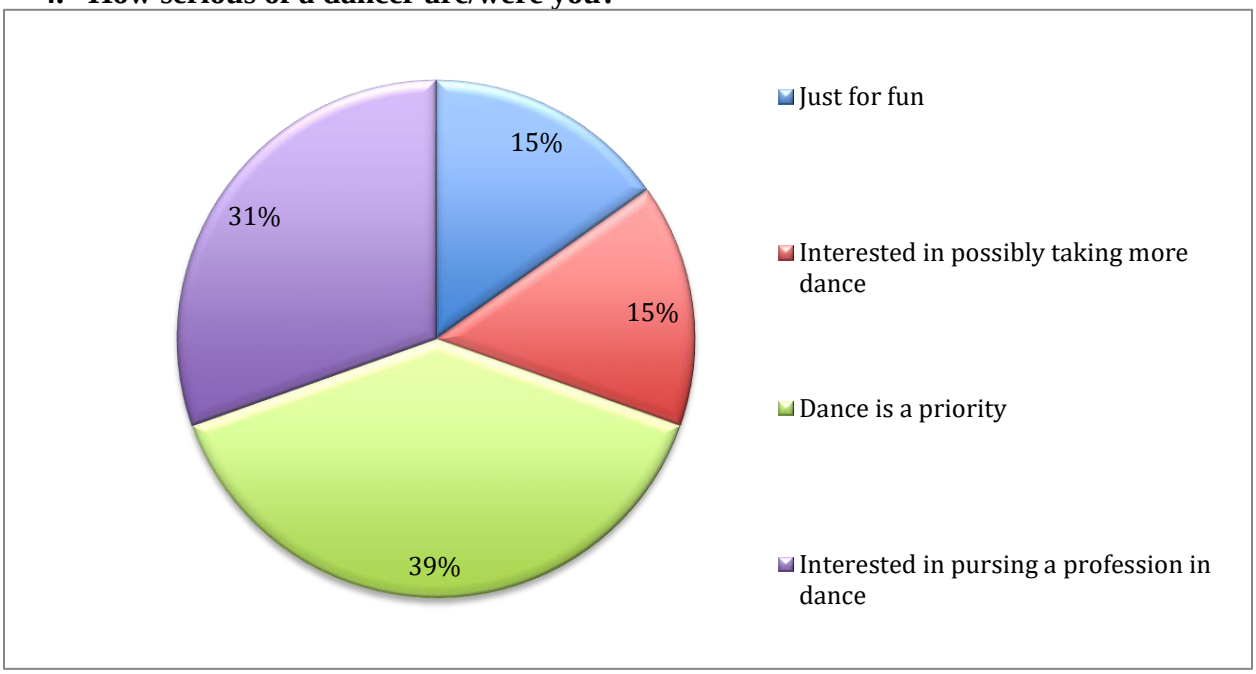
1. **How long have you danced?**
    a. Min: 2 years
    b. Max: 38 years
    c. Average: 13 years
2. **At what age did you begin dancing?**
    a. Min: 2 years old
    b. Max: 16 years old
    c. Average: 6 years old
3. **What genres of dance have you taken?**
    a. Given options



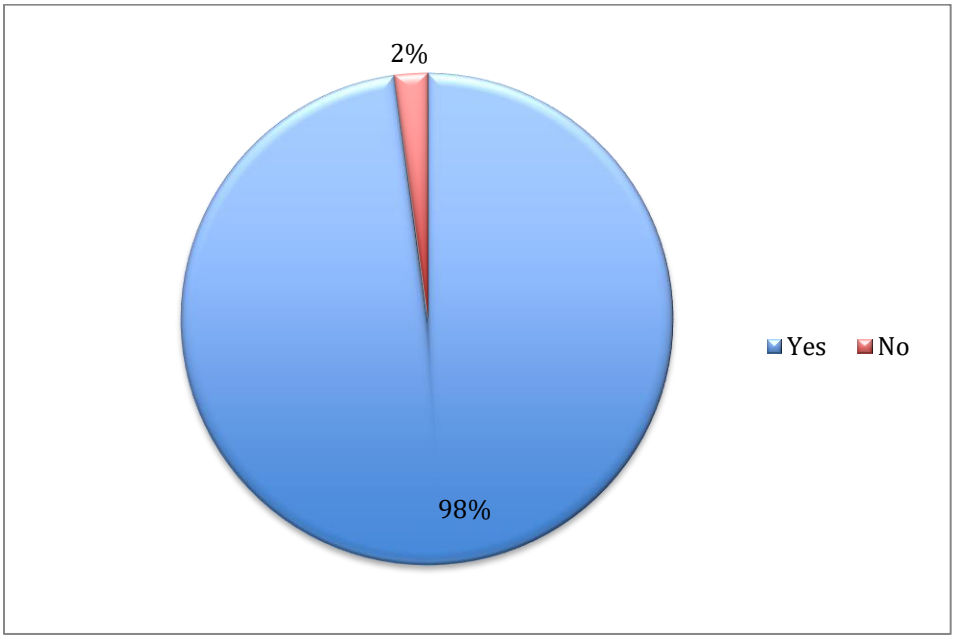
b. Other

- *Acrobatics (3)*
- *Ballroom (3)*
- *African (3)*
- *Improv (2)*
- *Belly Dance*
- *Musical Theatre*
- *Breakdance*
- *Vintage Folk Dancing*

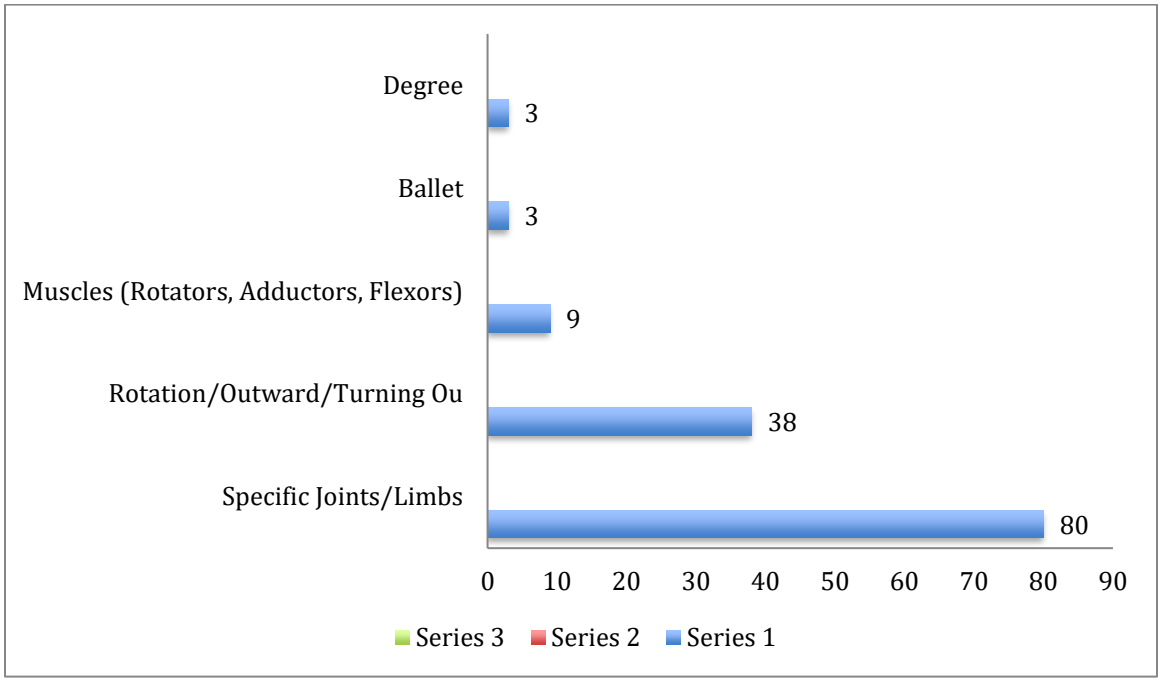
4. How serious of a dancer are/were you?



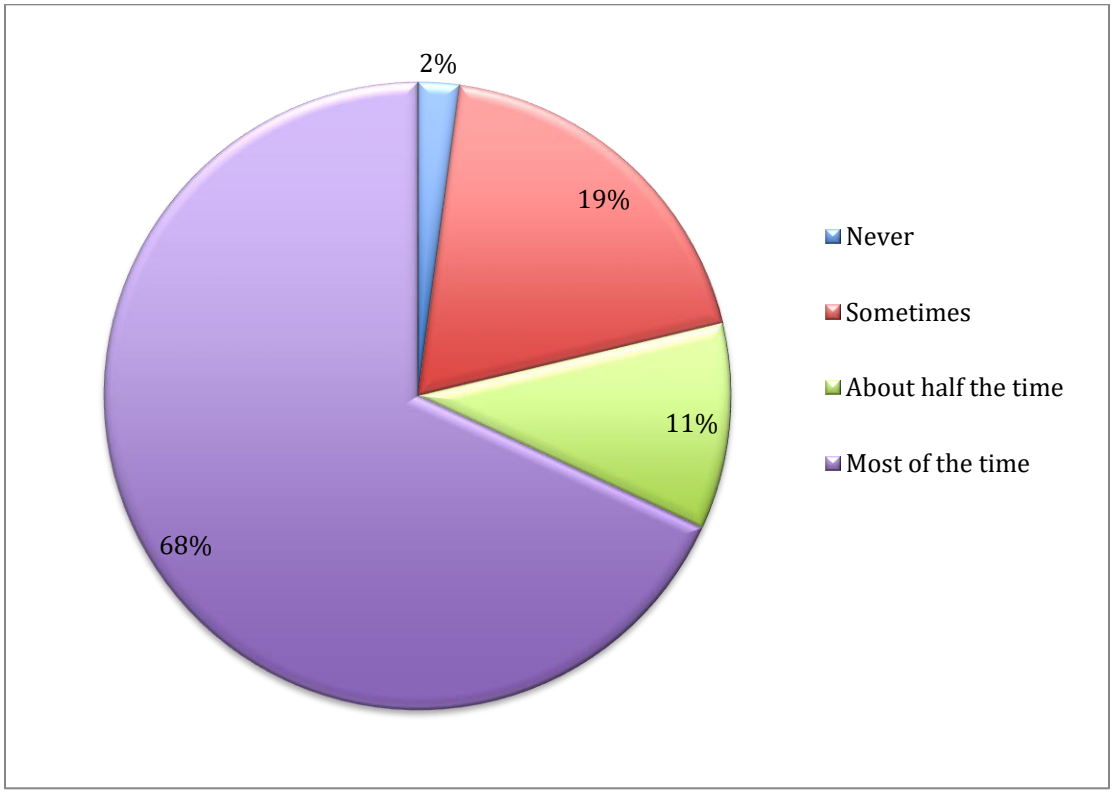
5. Are you familiar with the term turnout?



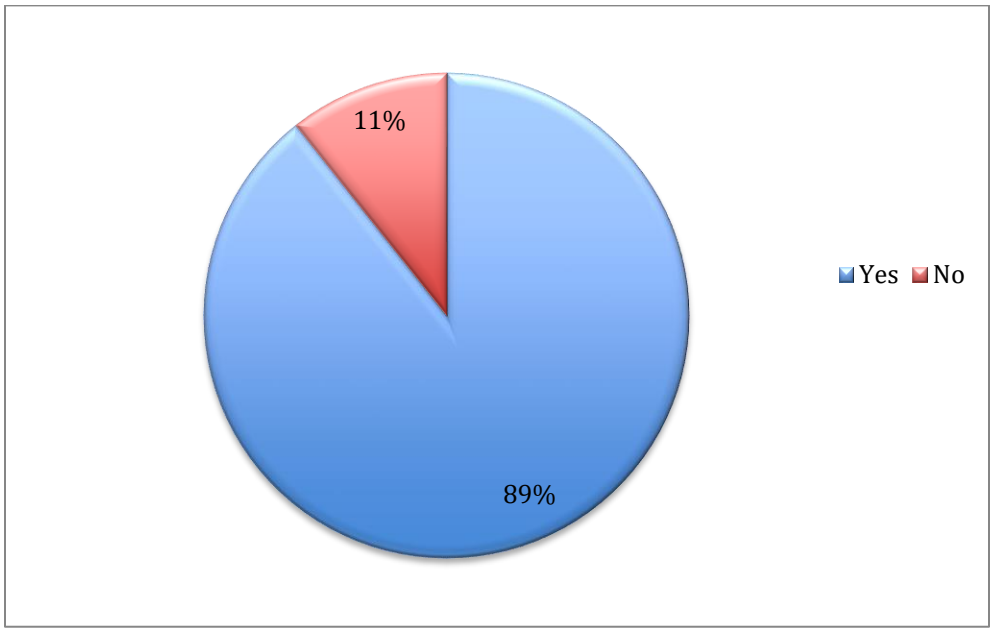
6. What does the term turnout mean to you?



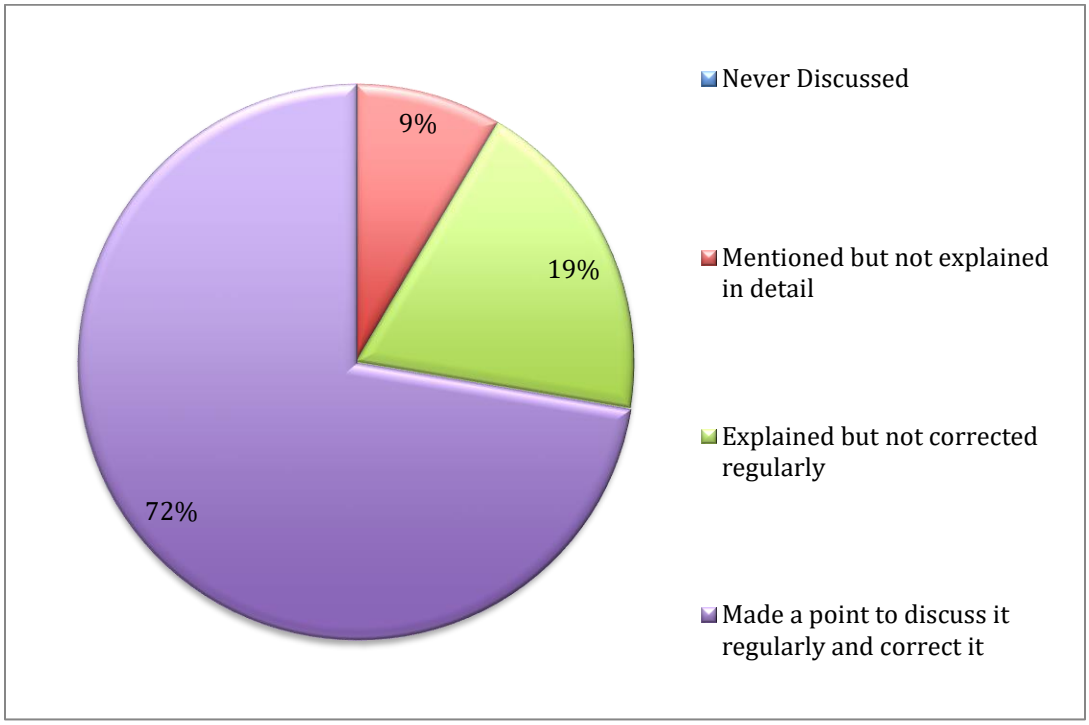
7. How often do you use turnout?



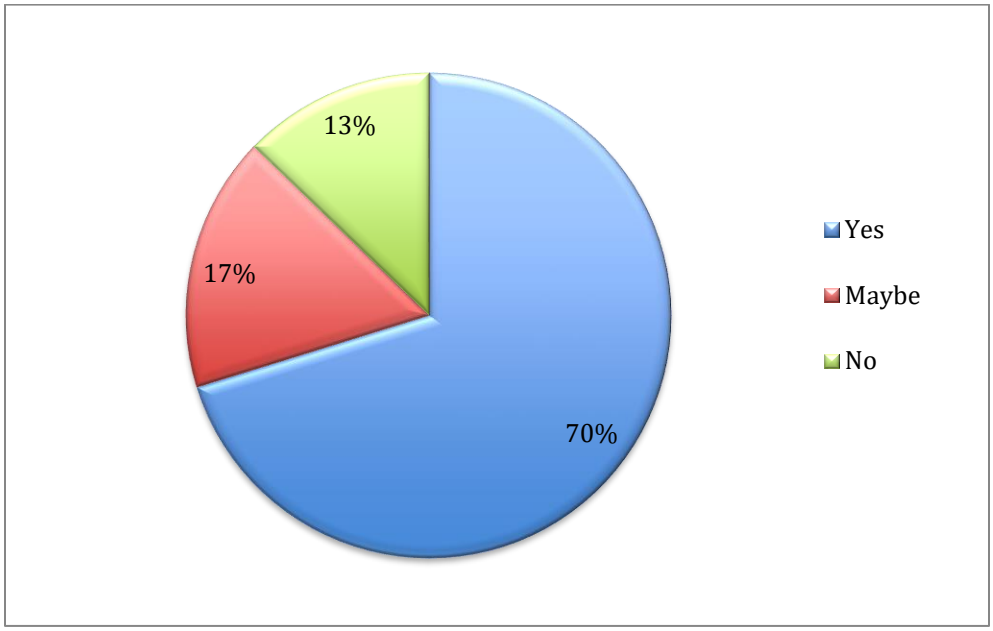
8. **Did your teacher/choreographer/studio ever discuss "compensated" or incorrect turnout?**



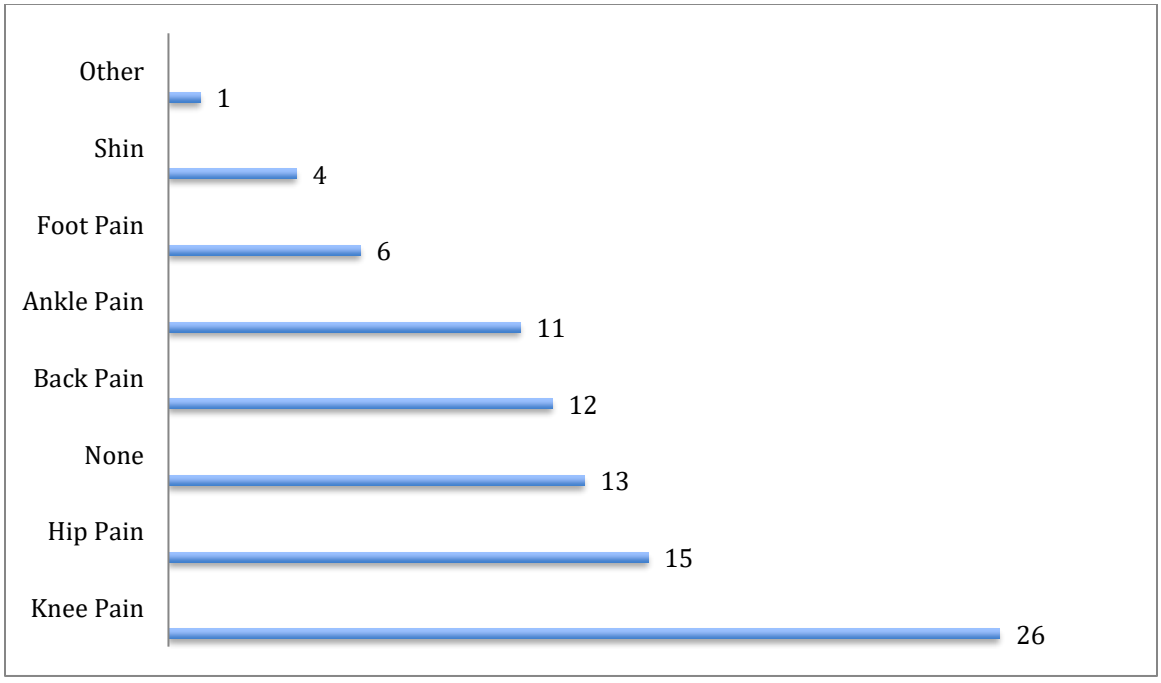
9. **How important was correct turnout to your teacher/choreographer/studio?**



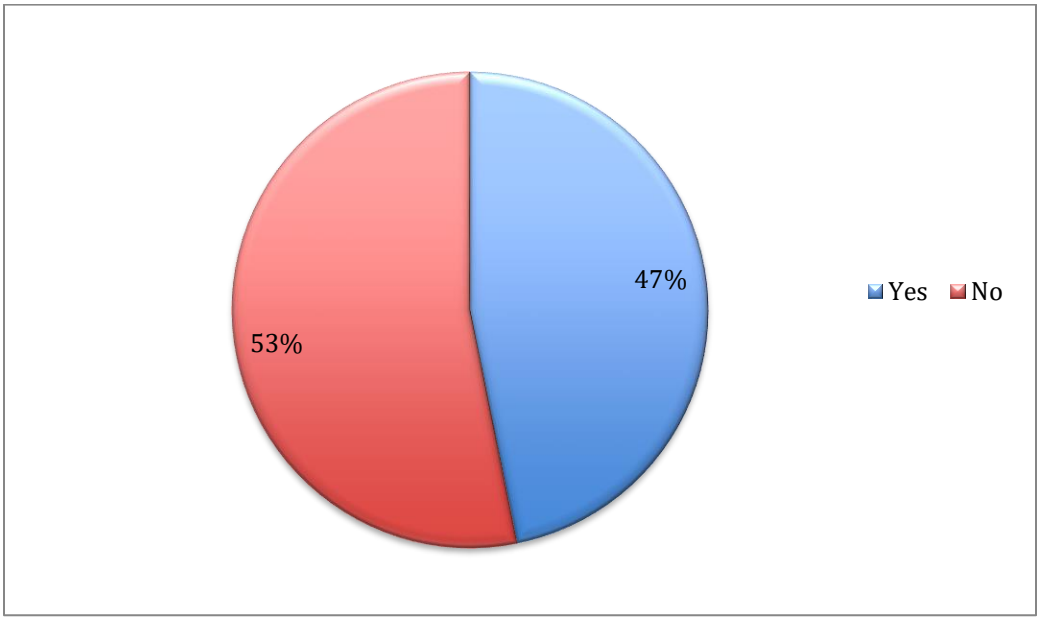
10. Have you ever felt pressured to have a perfect or perfect turnout?



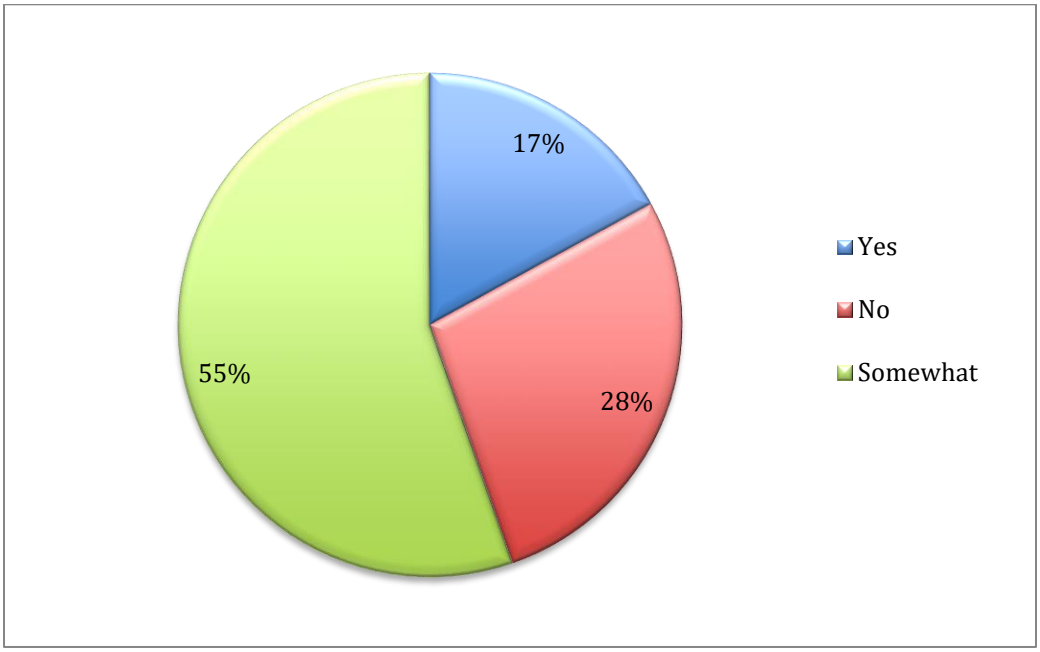
11. Have you experienced the following that can be attributed to compensated turnout?



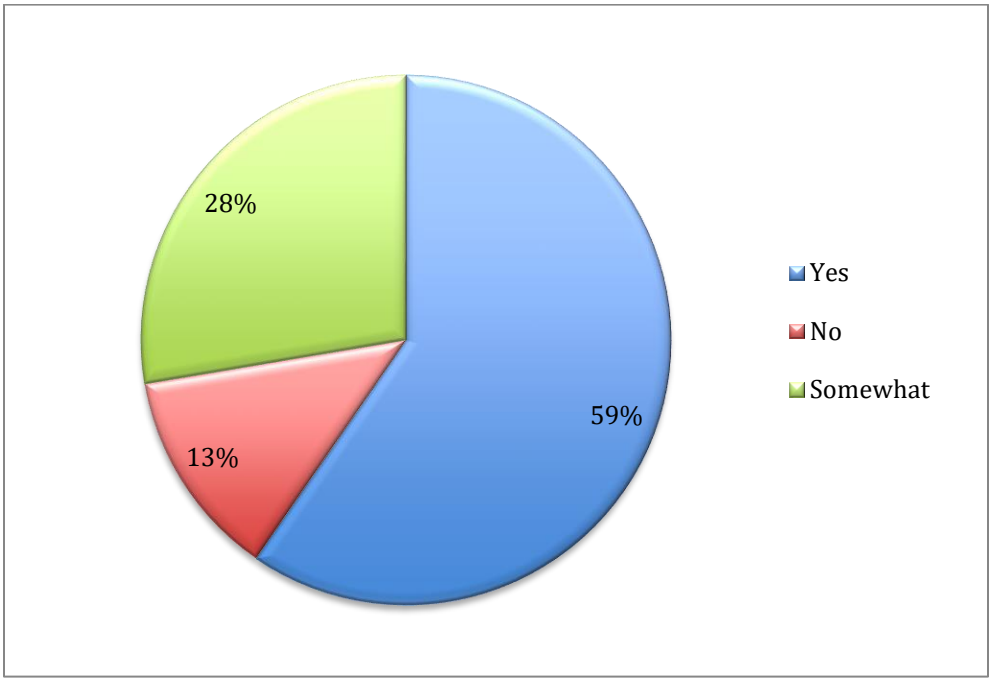
12. Did you always report any pain or injury to your dance instructor?



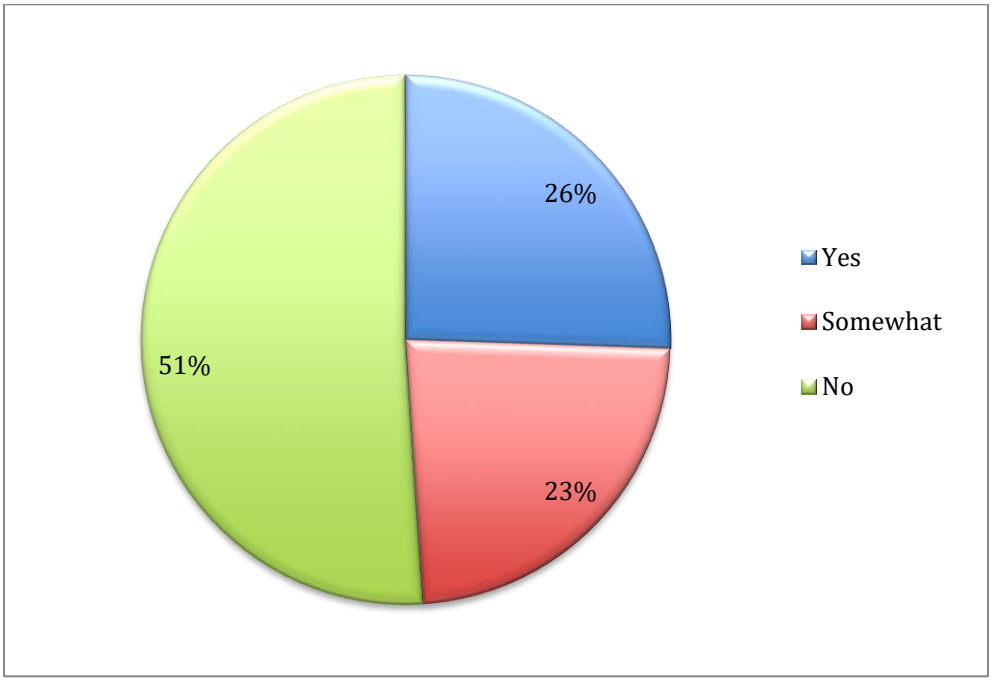
13. Did you ever feel pressure to not report pain or injury?



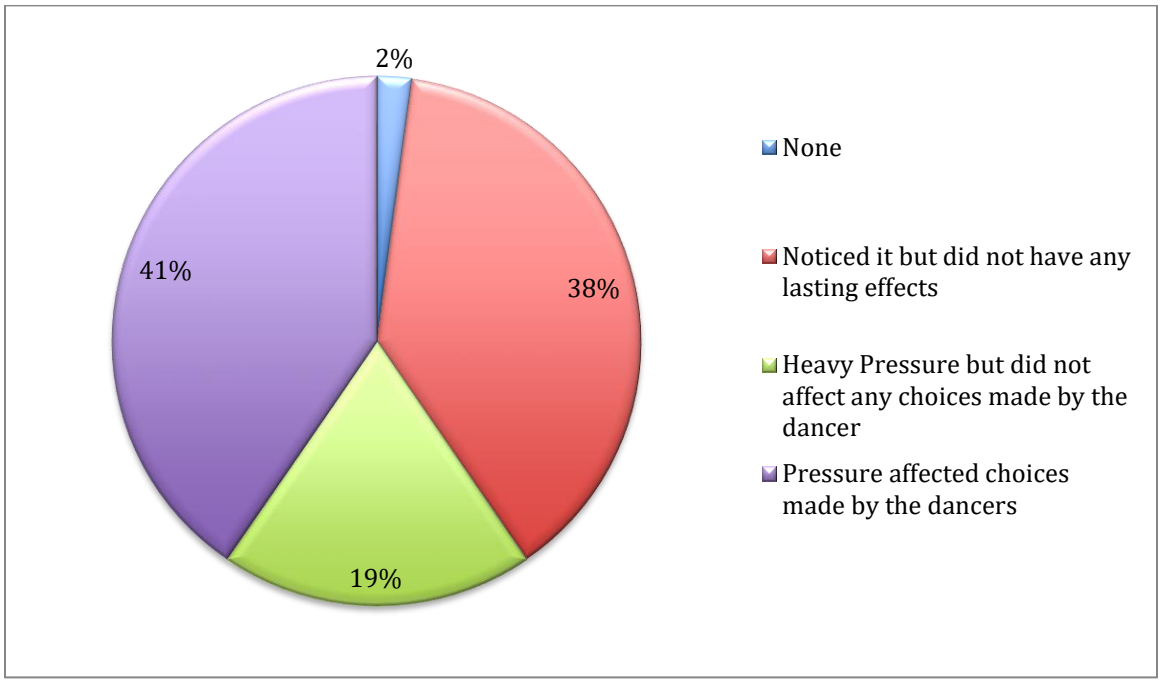
14. Did you ever feel pressure to continue dancing despite pain or injury?



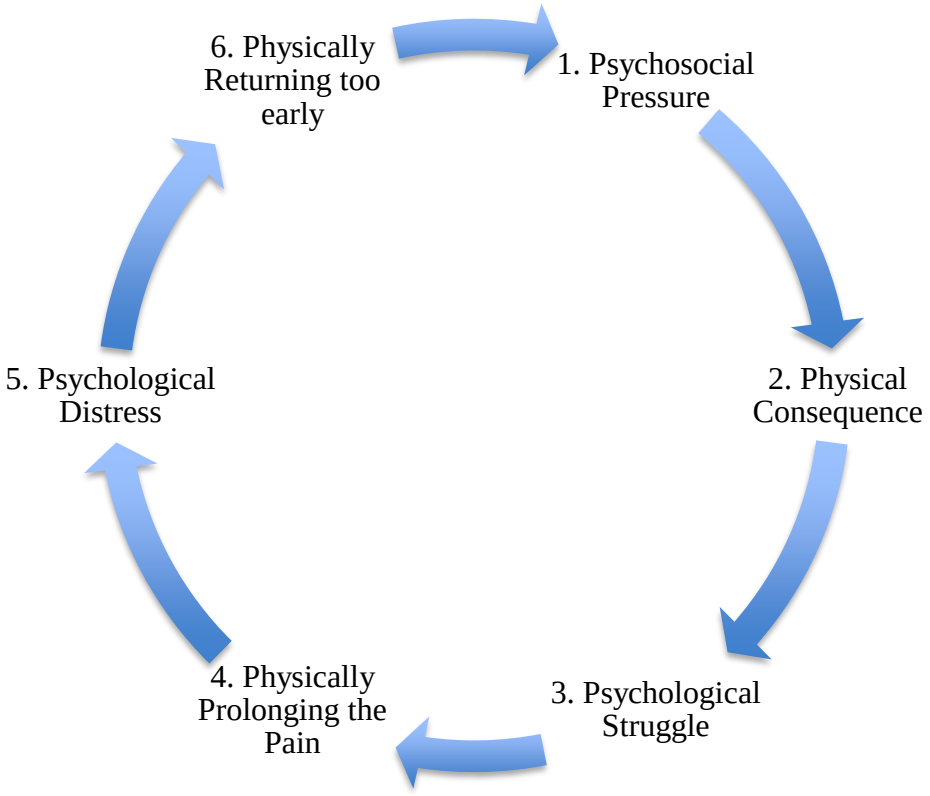
15. Were there any awards for achieving perfect turnout?



16. To what degree did you experience mental/social/professional pressure in the dance atmosphere?



Appendix F Physical-Psychosocial Injury Cycle



1. *Psychosocial pressure* leads to making compensations.
2. *Physical consequence* of the compensations in the form of pain
3. The dancers has a *psychological struggle* in deciding if she should report the pain.
4. The *pain is prolonged* as the dancer has inner turmoil.
5. The dancer experiences *psychological distress* while reporting the injury and being forced to sit out.
6. The dancer decides to *return to dance* before fully rehabilitated due to psychosocial pressure (*Step 1*).

By returning to dance before fully rehabilitated, the dancer is vulnerable to another physical consequence (*Step 2*), thus reentering the cycle.